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ABSTRACT

Developed from a review of research, policies, exemplary practices, and leading thinking, this guide addresses educational program design questions. The document is divided into two parts, Part One contains the recommended design features of career and technical education, including these 12 operational design features: learning context; audience; signature; expectations; processes; organization; partnerships; staff; environment; measures and indicators; celebrations; and financing. Part Two describes the design process for improving career and technical education. These fifteen steps are described: determine purpose and scope; determine the process; select committees; select a facilitator and obtain technical assistance; plan communications; hold the first meeting; conduct interviews, surveys and site visits; review recommendations; select and/or adapt design features; assess programs for gaps; prioritize gaps for action; develop a plan to close the gaps; submit the plan; disband the design group; and monitor the implementation of the plan. Appendix I contains the process document for developing the presented recommendations. Appendix II lists the design group members. Appendix III describes the process for developing professional judgment ratings. Appendix IV contains the tables of recommended operational design features in terms of progressiveness and extent of current application, relevance to education levels, and uniqueness. (SLR)

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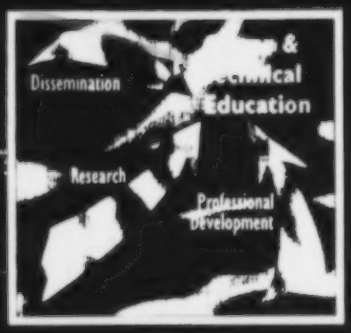

New Designs for Career and Technical Education at the Secondary and Postsecondary Levels: Design Guide for Policy and Practice

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NEW DESIGNS FOR CAREER AND TECHNICAL EDUCATION AT THE SECONDARY AND POSTSECONDARY LEVELS: DESIGN GUIDE FOR POLICY AND PRACTICE

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ABSTRACT

The purpose of *New Designs for Career and Technical Education at the Secondary and Postsecondary Levels* was to develop new directions for career and technical education at the secondary and postsecondary levels in the United States. For this project, "new" designs means based on a coherent synthesis of the latest research, relevant policies, exemplary practices, and leading thinking on career and technical education (CTE) at the secondary and postsecondary levels. Building upon work accomplished through two earlier projects funded under the National Center for Research in Vocational Education at the University of California, Berkeley, *New Designs for the Comprehensive High School* (Copa and Pease, 1992), and *New Designs for Learning: K–12 Schools* (Copa, 1999), and *New Designs for the Two-Year Institution of Higher Education* (Copa and Ammentorp, 1998), this project identified design elements and specific recommended features to be considered in the design of CTE programs. The research project was conducted under the auspices of the National Research Center for Career and Technical Education, University of Minnesota, with funding through the Office of Vocational and Adult Education, U.S. Department of Education, Washington, DC. George H. Copa, Professor in the School of Education, Oregon State University, was Project Director, and Susan J. Wolff, was Project Coordinator. The project was funded for 2000, 2001, and the first half of 2002. The two products of the project are *Design Guide for Policy and Practice* and *Compendium of Design Review of Related Research, Policies, and Exemplary Practices.* The *Compendium of Design Reviews* is available at: http://newdesigns.orst.edu.

The research project addressed the mission, values, vision, goals, and performance indicators for career and technical education, as well as 12 aspects of its operation, including learning context, audience, signature, expectations, process, organization, partnerships, staffing, environment, accountability, celebration, and finance. The resulting recommendations are based on a review of related research, policies, and exemplary practices, and extensive discussion and review by leaders in the practice of career and technical education at the secondary and postsecondary levels of education across the United States.

The project intended to capture and communicate the collective voice of leadership in career and technical education at the secondary and postsecondary levels regarding future direction for the field. Both leaders in policy and practice and researchers were actively involved in the design process. A 13-member National Design Group, with the purpose of advising the Project Director and Coordinator, was appointed from among state leaders in Career and Technical Education; counselors, teachers, and administrators; CTE teacher educators and researchers; and business and industry. The members are listed in Appendix II. To seek further professional peer review of the work done by the Project Staff and the National Design Group, four National Design Studio workshops were held—two in the fall of 2000 and two in the fall of 2001. These additional 100 leaders in CTE reviewed and extended the design recommendations emanating from the project. Participants in the National Design Studios workshops are listed at: http://newdesigns.orst.edu. Additional steps to the research included visits to exemplary sites (secondary, postsecondary, or combined, at each of the locations where the National Design Group met or where the National Design Studios were held) and presentations from agencies regarding exemplary practices. The sites visited and agency presentations are listed at: http://newdesigns.orst.edu.

What Is New About New Designs?

This project makes new contributions to the directions career and technical education should take in the United States in several ways: (a) the design features are the result of simultaneous consideration of both secondary and postsecondary levels of career and technical education; (b) the design features form a coherent systems perspective of career and technical education that is comprehensive, internally consistent, and aligned; (c) the design features result from a current review of research, policies, exemplary practices, and leading thinking; (d) the design features emanate from extensive dialogue among those involved and concerned about career and technical education; and (e) the design features respond to the context that career and technical education in the United States is a diverse and loosely connected enterprise—they are set forth as desired features and not as "one model fits all." The design recommendations include a design process that can be applied locally in individual high schools and community/technical colleges across the country. The process offers the recommended design features as a flexible model, allowing for customization by the stakeholders involved at a particular setting, who are assumed to be highly motivated to improve career and technical education and the services it provides to local youth and adults, organizations, and communities.

INTRODUCTION

This document is a guide developed for policy makers, school and college administrators, and career and technical education program leaders to address such design questions as:

- What should be the mission and desired features of both secondary and postsecondary career and technical education?
- How can career and technical education achieve maximum value and relevance at local and state levels?
- How can career and technical education best support and integrate into our national, state, and local education reform efforts?
- How do we organize a design/redesign process that involves our professionals and constituencies, and results in a consensual career and technical education plan for enhancing impact on learners and on communities as a whole?
- How can we build upon what others have done already, rather than beginning from scratch?

This guide presents:

- A lasting and unique mission of career and technical education at both secondary and postsecondary levels gleaned from thoughtful and critical considerations linking its past and future role,
- A cogent and compelling vision for career and technical education in the future,
- A portrait of key design elements and recommended features of quality and effective career and technical education programs, and
- A process for engaging others in thinking about the design/redesign of career and technical education programs.

The intent of the guide is that policy makers and leaders in practice will use its information and processes to make decisions about areas such as program structure and integration, resource allocation and accountability, staffing and staff development, scheduling and student grouping, facility organization, and community partnerships. Program leaders will find the guide valuable for such activities as curriculum redesign, stakeholder planning, learning spaces and materials development and organization, and collaborative work with other units of the school or college, district, and community.

The design features and the design process described in this guide were developed from an extensive review of the latest research, relevant policies, exemplary practices, and leading thinking on career and technical education at the secondary and postsecondary levels in the United States (the review is available as a series of Design Reviews at: http://newdesigns.

orst.edu). Now, it is time for policy makers, administrators, and program leaders to examine these approaches carefully, customize what is appropriate for their special settings, and "give it a go"! The aim of this guide is to improve CTE for students and for communities. Its worth will be realized in the changes it facilitates, but transformation will only happen through quality local leadership and participation.

PART I: RECOMMENDED DESIGN FEATURES OF CAREER AND TECHNICAL EDUCATION

The following project recommendations represent best thinking as well as a synthesis of all project activities and inputs at the time of writing the report. This is a work in progress. Recommendations need to be continually updated as the context of career and technical education changes and new research, policies, and exemplary practices emerge. The recommendations are presented in two sections: (1) foundational features of career and technical education policy and practice, and (2) operational features of career and technical education policy and practice. Based on overwhelming advice and professional judgment from both the National Design Group and participants in the National Design Studios, the recommendations address secondary and postsecondary levels of education as a whole. Throughout the development process, focus has been placed on identifying features of career and technical education that would enhance its impact on learners and on our society as a whole. While several of these features have already been identified in several other sources, many have not, and they have never been assembled in one comprehensive, coherent report with considerable external professional review. Validation of project recommendations was achieved in two primary ways: (1) grounding in available research literature (available at: http://newdesigns.orst.edu), and (2) peer review by recognized leaders in practice in career and technical education at the secondary and postsecondary levels across the United States.

Foundational Design Features of Policy and Practice

The desired foundational feature of career and technical education policy and practice included attention to the basic areas of mission, principles, vision, goal, and performance indicators. These foundational features serve to guide the development of more operational features of career and technical education presented in the next major section.

Mission and Purpose of Career and Technical Education

Key questions that directed examination of career and technical education's purpose and mission include:

- Why does career and technical education exist at the secondary and postsecondary levels in the United States?
- What should be the central, long-term, and distinguishing nature of the services it provides?
- What should be its core and lasting promises, or ways to add value to the quality of life, for individuals, communities, and society?
- What should make it unique in relation to other areas of education and its many other potential partners and collaborators?

The recommended mission statement for career and technical education was defined as follows:

> **The mission of career and technical education is to serve individuals and the nation through direct lifelong preparation for work, family, and community roles and responsibilities.**

The focus of career and technical education is on the interests and needs of individual learners and the nation or broader society as a whole. Career and technical education distinguishes itself from other educational programs by its direct attention to work, family, and community roles and responsibilities; other educational programs may and should make contributions to preparation for work, family, and community roles and responsibilities, but it is not their central or only purpose. Career and technical education provides preparation for work, family, and community roles and responsibilities over the entire lifespan—from early childhood to late adulthood. While the major enterprise of career and technical education focuses on preparation for work roles and responsibilities in terms of number of students, staffing, and resources, the specific reference to family roles and responsibilities in the mission is to continue to recognize and affirm the inclusion of family and consumer sciences as a part of career and technical education and the contributions made by other areas of career and technical education in preparation for family roles and responsibilities. In the same way, the reference to community roles and responsibilities is to include the efforts of career and technical education, particularly in student organizations, aimed at student leadership development and community service and the overall and significant contributions of career and technical education to community/economic development.

Guiding Principles for Career and Technical Education

Recommended guiding principles for career and technical education at the secondary and postsecondary levels in the United States were developed in response to the following question: What should be the principles that guide how Career and Technical Education goes about providing its services? These guiding principles were proposed:

- **Individuals and nation** – Career and technical education serves the needs and interests of individuals and the nation as a whole.
- **Work, family, and community** – Career and technical education places high worth and importance on work, family, and community roles and responsibilities and their interrelationship in contributing to quality of life and the human endeavor.
- **Inclusiveness** – Career and technical education includes all learners who can benefit.
- **Learner-centeredness** – Career and technical education provides learning and support services that are personalized to the needs of each learner.
- **Lifelong opportunity** – Career and technical education provides learning opportunities across the lifespan.

- **Diversity** – Career and technical education advocates for and responds to diversity in learners and staff.
- **Integration** – Career and technical education blends with and makes contributions to other dimensions of education and support services.
- **Collaboration** – Career and technical education seeks opportunities to work with other organizations and agencies to improve learning.
- **Quality** – Career and technical education uses high learning standards and continuous quality improvement.
- **Adding value** – Career and technical education adds value to the comprehensive educational enterprise in the United States by providing learning for work, family, and community roles and responsibilities.
- **Futuristic orientation** – Career and technical education orients to the future needs of work, family, and community roles and responsibilities.
- **Accessibility** – Career and technical education strives to have no barriers to its learning services.
- **Innovation** – Career and technical education is innovative and creative in providing learning services.

These principles should be integral to career and technical education practices and policies, both in their long-term direction and day-to-day operation.

Vision for Career and Technical Education in the 21st Century

What is the future of career and technical education we should aim to create by 2010?[1]

By the year 2010, career and technical education (at the secondary and postsecondary levels) will be:

- **Essential** – Career and technical education is an essential and valued part of everyone's learning and human sustainability.
- **Dynamic** – Career and technical education is up-to-date, active, and engaging learning.
- **Integrated** – Career and technical education integrates learning across educational levels, settings, and subjects.

[1] The vision statement was formed to be responsive to the following criteria: Is framed and oriented by mission; describes a desired future state of affairs; gives direction and adds to focus; represents a bold challenge; attracts interest, energy, commitment, partnerships, and resources; is feasible and doable; is easily understood and owned by external and internal shareholders; can easily tell if progress is being made and when it is accomplished.

- **Supported** – Career and technical education is enthusiastically supported by key stakeholders including parents, students, business and industry, school/college staff and governing boards, and politicians.

- **Proven** – Career and technical education demonstrates a solid return on investment in terms of student performance in work, family, and community roles and responsibilities.

Sample of Goals and Performance Indicators for Career and Technical Education

Clear goals and performance indicators are pivotal to realizing the career and technical education mission, principles, and vision for 2010. Sample goals and performance indicators to be used to achieve the vision for 2010 follow:

- **Essential** – Career and technical education is an essential and valued part of everyone's learning and human sustainability.

  Goals:
  - Make career and technical education a component of all academic courses in elementary, middle, and high schools and colleges.
  - Address career and technical education in teacher/instructor education programs across all subjects and levels.
  - Make K–20 career pathways planning available to all students using the 16 career clusters under development by the U.S. Department of Education.

  Performance Indicators:
  - Percentage of elementary, middle, and high schools and colleges with career and technical education as a component of academic courses.
  - Percentage of colleges and universities that address career and technical education across all teacher/instructor education programs.

- **Dynamic** – Career and technical education is viewed as up-to-date, active, and engaging learning.

  Goals:
  - Expand teacher/instructor preparation and staff development for career and technical education.
  - Increase partnerships to support learning internally among teachers/instructors of different subjects and externally with business and industry.
  - Increase use of real life examples and experiences in career and technical education courses.

  Performance Indicators:
  - Assessments of currency and engagement by former students and their employers via follow-up studies.
  - Retention of learners in career and technical education programs.

- **Integrated** – Career and technical education integrates learning across educational levels, settings, and subjects.
  Goals:
  - Develop and implement clear and seamless pathways from secondary to postsecondary career and technical education programs.
  - Put in place defined agreements between secondary and postsecondary education regarding acceptance of credits.
  - Increase shared faculty between secondary and postsecondary career and technical education programs.
  - Increase interdisciplinary teaming between academic and career and technical education programs.
  - Embed academic knowledge and skills in career and technical education programs.

  Performance Indicators:
  - Increased enrollment in career and technical education at secondary and postsecondary levels.
  - Increased receipt of dual credits for both secondary and postsecondary education by students in career and technical education.
  - Increase transfer rates between secondary and postsecondary career and technical education programs.
  - Increased benefits and incentives to faculty who are working across educational levels and disciplines.
  - Increased retention of students.
  - Improved academic and career and technical education performance by learners.

- **Supported** – Career and technical education is enthusiastically supported by key stakeholders including parents, students, business and industry, school/college staff and governing boards, and politicians.
  Goals:
  - Increased positive support for career and technical education from business and industry.
  - Frequent promotion of career and technical education by all school leaders and instructional staff.
  - Increased understanding of career and technical education by parents and students.
  - Increased political understanding and support for career and technical education for all students.

  Performance Indicators:
  - Increase in active participation by business and industry in advocacy for career and technical education with other stakeholders.
  - Increased enrollments in career and technical education.
  - Increased funding in terms of different sources and amounts for career and technical education.
  - Increased use of career and technical education programs and services to address state and national needs.

- **Proven** – Career and technical education demonstrates a solid return on investment in terms of performance and advancement in work, family, and community roles and responsibilities.
  Goals:
  - Develop and implement a national student follow-up system to determine the value of the career and technical education learning experience.
  - Develop and implement an information system to communicate workforce needs and to demonstrate the responsiveness of career and technical education to those needs.
  - Develop and implement national skill certification standards for all career and technical education programs.

  Performance Indicators:
  - Scope and quality of student follow-up information available to evaluate investment in career and technical education.
  - Increased level of funding contribution to educational institutions to support career and technical education.
  - Assessment of independent review teams in each state addressing implementation of national skill certification standards for career and technical education programs.

Operational Design Features for Policy and Practice

In this section, the recommended features of career and technical education are presented for each of the 12 design elements—each element representing an important operational dimension of career and technical education policy and practice. First the design elements will be listed and described followed by a presentation of overriding recommended operating features for career and technical education across all elements, and then by top-ranked recommended features pertaining to each element.

Operational Design Elements

The 12 design elements of career and technical education's operation addressed in the recommendations are:

Learning Context	**Learning Partnerships**
Learning Audience	**Learning Staff**
Learning Signature	**Learning Environment**
Learning Expectations	**Learning Accountability**
Learning Process	**Learning Celebration**
Learning Organization	**Learning Finance**

Following is a brief description of each design element:

- **Learning Context** – Attention to the *learning context* specifically recognizes and reinforces the need to tailor design features of the school or college to its unique situation. Focus is on the unique assets, challenges, opportunities, and aspirations of the institution under consideration. In general, *assets* are features about the institution that are

working and that should be retained in the new design; *challenges* are features that are not working and need to be fixed; *opportunities* are features that cannot be maximized, given the way the institution is currently operating; and *aspirations* are the future hopes and dreams for the institution.

- **Learning Audience** – The *learning audience* in the design process refers to those whose needs and interests the school or college is to serve. Typically, educational institutions are thought of as only serving students—young and older. However, educational institutions may also serve other organizations and communites, as well as being a place for their own staff to continue to learn.

- **Learning Signature** – The *learning signature* focuses on what is to be special and unique about the school or college under design or redesign. While most educational planning processes include consideration of mission, vision, values, and logo, these components are rarely linked together in a compelling and highly meaningful signature for the institution. The literature on effective schools and colleges concludes that giving the institution a special focus provides coherence, consistency, and spirit to the institution, and thereby adds to the quality of the learning experience and accomplishments. If the learning signature is real and meaningful, one should be able to ask anyone involved in the institution—teaching staff, student, parent, custodian, or secretary—what is special about the institution, and get the same basic answer.

- **Learning Expectations** – *Learning expectations* address what is promised in terms of learning results or outcomes from the institution being planned. The list of learning expectations represents the students' accomplishments as promised by the institution in exchange for the public's and students' investment in teaching and learning.

- **Learning Process** – Typically, the *learning process* consists of design features for curriculum, instruction, and assessment. In new forms of teaching and learning, learning events or activities naturally and strategically link assessment, curriculum, and instruction. Assessment is continuous, curriculum is interdisciplinary, and instruction is "construction"—with learners as active participants building their own personal knowledge. With this strategy, subject areas are necessarily and naturally integrated, learning inside the institution and in the community is valued and closely coordinated, and learning is viewed as a continuous process requiring seamless transitions from pre-school through elementary, middle, high, and postsecondary schools.

- **Learning Organization** – Attention to the *learning organization* element results in decisions about how to organize the time schedule, learners, staff, learning process, decision making, technology, and learning settings in order to best support the learning process described above.

- **Learning Partnerships** – The *learning partnerships* element of the design process focuses on those who need to be involved in making the learning organization and learning process work to achieve the learning expectations. An important consideration of learning partnership is identifying the many partners, both internal and external, who are needed. For example, the list of partners for a CTE program may include: families, business and industry, government, churches, community-based organizations and agencies, higher education institutions, school staff, students, alumni, senior citizens, funding sources (i.e., foundations), parent/teacher associations, neighboring schools and colleges, and regional cooperative service agencies. It is also important to address the desired characteristics of the partners and the various resources and services that might be shared. This sharing of resources is a two-way process that includes not only external partners providing resources and services to the institution, but also the school or college providing resources and services to the external partners.

- **Learning Staff** – It is important to consider the make-up of the *learning staff* and their desired features. Learning staff are thought about in terms of learning teams as well as individuals. With increased emphasis on learning projects and informal learning, students are emerging as an important component of the learning staff. And, with stronger and more intense partnerships, the partners are increasingly viewed as a part of the learning staff. Staff development, as another component of the learning staff element, should focus on current and future needs, as well as consideration of who is in the best position to provide effective staff training.

- **Learning Environment** – The learning environment, which includes decisions about technology, equipment, and facilities, extends well beyond the school or college buildings to include all of the learning settings used by learners (e.g., workplace, home, public library, community). Smaller learning environments placed strategically around the community optimize the use of partnerships. The close blending of school or college and community ensures that learning is rigorous and relevant. A learning environment networked by information technology provides each learner with essentially their own personal learning environment.

- **Learning Accountability** – *Learning accountability* addresses the need to take very seriously the recommendations and commitments of an institution's stakeholders in implementing new designs for the institution. This element ensures there will be reporting back on how change is progressing—especially its impact on learning. The design features for accountability describe who is responsible, and when and how reporting back will occur. The focus of accountability should tie directly back to the design specifications developed in the learning context element at the beginning of the design process, and then to the design attributes developed in response to each of the other design elements. Institution staff are usually assigned responsibility for developing measures or indicators of accomplishment that are acceptable to the policy-making group, typically the board/trustees in a public institution.

- **Learning Celebration** – *Learning celebration* addresses the need to align incentives and recognition of progress and success in moving toward new design features. Many of our traditional learning celebrations need to be revised to communicate and reinforce the changes in learning and the operations of schools or colleges being recommended. Annual graduation ceremonies, quarterly competitive grades, and sports trophies may contradict learning expectations that focus on preparing for lifelong learning; the challenges of work, family, community, and personal responsibilities; high expectations for all learners; and productively working together as a learning community. Learning celebrations should reinforce the design features of all elements of the design process—particularly the learning expectations and learning signature. Learning celebrations might include such varied approaches as: displays of student learning products located throughout the institution and in many places in the community, closed-circuit television screens around the institution showing the names and contributions of all the learning partnerships working on a given day, and teams of students being recognized by community-based organizations for their solutions to important community problems.

- **Learning Finance** – The *learning finance* element of the design process focuses broadly on costs and revenues for building and operating new or restructured schools or colleges. Often, the goal of this element is to implement new designs in a school or college with no more, or even reduced, operating costs than for an average existing institution. Cost considerations may frequently involve a trade-off among technology, staffing, and partnerships. The focus on revenue often leads to exploring new sources of revenue for the institution as a partner in social and economic development of a community.

Overarching Operational Design Features of Career and Technical Education

In the following section, many desired operational features of career and technical education programs are presented for consideration. As one looks across all of the features, it may be a helpful orientation to first view what are thought to be the overarching or crosscutting features that are recommended for career and technical education operation as a whole. Based on discussions by the National Design Group at its last meeting and reflection by the project staff, the five overarching desired operational features for the future direction of career and technical education are:

- **Learner-centeredness** – Career and technical education must open opportunities for learners in terms of work, family, and community roles and responsibilities and continued learning; career and technical education must provide multiple ways to learn what is important; career and technical education must "wrap" support services around the learner to meet the learner's needs; and career and technical education must personalize or customize the learning experience to each and every learner.

- **Connectivity** – Career and technical education must build networks for learners among the times, places, and ways for learning that can assist the learner to create and take advantage of present and future life opportunities and continued learning; career and technical education must link and blend learning in schools and colleges with learning in other settings; and career and technical education must integrate learning between

academic education and career and technical education, and among career and technical education programs.

- **Accountability** – Career and technical education must hold high expectations for itself and learners; career and technical education must use both internal and external standards to set these high learning expectations; career and technical education must do continuous assessment of its quality and efficiency, and use this information to improve programs.

- **Sustainability** – Career and technical education must maintain and improve its effectiveness and efficiency by being flexible and innovative in its operations; career and technical education must employ partnerships to gain mutual benefits; and career and technical education must be entrepreneurial in seeking, creating, and taking advantage of opportunities.

- **Vibrancy** – Career and technical education must continue to be up-to-date with its changing external context; and career and technical education must strive to be exciting and engaging.

Specific Operational Design Features of Career and Technical Education

The recommendations that follow are specific to each of the operational design elements for career and technical education. Only the most important features are presented for each element and they are in priority order, starting with the most important feature. The relative importance of each feature was based on a professional judgment rating developed on the basis of input from the National Design Group and National Design Studio participants (see Appendix III for a more detailed description of the rating process). A complete listing of design features for each element along with much additional information, including related references, is provided in Appendix IV. The recommendations for each element are introduced by first posing the questions that were addressed by project staff, the National Design Group during meetings, and the participants in the National Design Studio workshops.

Learning Context of Career and Technical Education

Recommended design features for this design element of career and technical education operation are presented in two parts: (1) the context for the whole high school or college, of which career and technical education is only one component, and (2) the context relating specifically to career and technical education in the high school and community/technical college.

Whole School/College Context

QUESTION: What are the most important features of the learning context (i.e., assets, challenges, opportunities, and aspirations) of the *whole school/college* that need to be considered by career and technical education at the secondary and postsecondary levels?

- **Be up-to-date and vibrant** – Requires that the learning experience be current and dynamic, encourage innovation, and unleash all human potential in response to an ever-changing context.

- **Build shared vision of quality** – Requires development of clearer and more focused direction and commitment to high quality that is deeply shared by stakeholders.
- **Search for coherent synergy and connectedness** – Requires more and newer forms of coherent partnerships, alliances, compacts, and collaborations with families, business and industry, labor, education, and community-based organizations.
- **Be portable for the learner** – Requires that what is learned be transportable and recognized (credited) in other learning environments.
- **Enhance public perception and credibility** – Requires creating and maintaining a more positive public image of education.
- **Insure usefulness of learning** – Requires attention to the application of learning to the challenges and opportunities of all life places (i.e., personal, work, community, family).
- **Design with external community** – Requires planning the learning experiences by listening to and working with the community external to the school or college.
- **Increase and enhance use of learning technology** – Requires learning technology that is accessible, maintained, and used extensively.
- **Be cost-effective and sustainable** – Requires constant attention to developing needed resources, improving cost-effectiveness, and operating with economic sustainability.
- **Improve accountability** – Requires better accounting for learning done in a variety of ways, and that the institution as a whole be performance-based.
- **Respond to all learners** – Requires increased focus on, responsiveness to, and success for all learners.
- **Be a component of lifelong learning** – Requires the learning experience to build on prior learning experience and be integrated with and encourage lifelong learning.
- **Be realistic** – Requires that recommendations for improving learning be feasible in terms of available resources.
- **Enhance global perspective** – Requires an international perspective of learning expectations, processes, and organization.
- **Give pride and joy** – Requires developing more pride and joy (recognition and reward) in the learning experience by staff and learners.

Career and Technical Education Context

QUESTION: What are the most important design features of the learning context (i.e., assets, challenges, opportunities, and aspirations) that are specific or unique to career and technical education at the secondary and postsecondary levels?

- **Align with the larger context** – Assures that the context for career and technical education is supportive and contributes to the larger context faced by the whole school or college, of which career and technical education is a part.

- **Become a learning system** – Insures that secondary and postsecondary career and technical education operate as a coherent and connected system (i.e., trouble-free transfer of learning internally and externally, staff teaming across educational levels, unlimited advancement and continued learning, aligned prerequisites, concurrent and dual enrollment).

- **Build partnerships** – Aggressively develops new and renewed alliances with the community to enhance learning opportunities in career and technical education.

- **Attract and sustain teachers** – Provides feasible ways of staffing and staff development for teachers to insure very high quality career and technical learning opportunities.

- **Define high quality** – Describes a coherent and cohesive set of features for model career and technical education, and needed changes in current programs.

- **Improve image** – Very positively enhances perception of career and technical education to students, parents, and school and college staff.

- **Provide adequate and flexible resources** – Promotes resource sustainability (i.e., better use of existing sources, developing new sources, increasing flexibility of use, being more realistic in plans) for providing and continuously improving learning opportunities in career and technical education.

- **Develop leadership** – Identifies the needed skills and develops an effective administrative leadership cadre for present and future career and technical education.

- **Serve all students** – Is perfectly clear that career and technical education provides learning opportunities that are valuable and accessible to all students.

- **Expand thinking** – Openly considers new and innovative approaches to career and technical education and the effective breakdown of resistance to make needed changes.

- **Include multiple purposes with appropriate assessment** – Seriously affirms that career and technical programs address many purposes (e.g., work, family, community; short- and long-term goals; various educational levels) that are all valued and require varied foci and means of assessing learning.

Learning Audience for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning audience to be served by career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning audience are consistent with and supportive of the design features recommended for other design elements.

- **Identify the various groups who are to benefit** – Identifies who is to benefit from career and technical education in name and characteristics. Include the following categories of learners:
  - **Individuals** – Youth and adults.
  - **Organizations** – Business and industry, organized labor, other educational institutions (i.e., K–12, college, university), government agencies, and professional associations.
  - **Geographic regions** – Communities, regions within states, states, multi-state regions, nation, and world.
  - **Society-at-large** – Whole social and economic culture.

- **Describe the needs of the groups who are to benefit** – Identifies the needs, both educational and supporting services, by the groups who are to benefit from career and technical education.
  - **Needs of individuals** –
    - **Initial specialization** – Those needing preparation for first real roles and responsibilities in work, family, and community life; could be focused on career cluster or specific occupation; includes all aspects of the industry; could be youth or older individuals entering work, family, and community roles for first time.
    - **Exploration** – Those needing more in-depth study and first-hand experience with their own interests, aptitudes, and capabilities and the world of work, family, and community; includes career and technical planning and decision-making skills; could be individuals of young age contemplating future career and technical opportunities or older individuals considering role mobility, both voluntary and involuntary.
    - **Retraining** – Those needing to prepare for different roles and responsibilities in work, family, and community life because of a wish to change roles and responsibilities or a need to change because of changing context (e.g., loss of job).
    - **Updating/advancement** – Those needing continuing education or changes in work, family, and community roles and responsibilities they currently have in order to keep/perform better in the role or seek the opportunity of promotion in salary, position, or other benefits.
    - **Academic** – Those needing general academic skills not specific to career and technical education; could range from basic literacy or remediation in reading, communications, and mathematics to advanced theoretical knowledge in science, social studies, arts, language, and mathematics; could be individuals of any age.

- **Awareness/orientation** – Those needing an introduction to the world of work, family, and community roles and responsibilities and opportunities; could be individuals of elementary age or immigrants or others entering work, family, and community roles and responsibilities for the first time.
- **Support services** – Those services needed in support and encouragement to be successful in career and technical education (e.g., child care, transportation, financial aid, health, counseling).
- **Further education and living** – Those needs for both continued learning and the opportunities it provides, as well as preparing for direct and successful entry into the world of work, family, and community life.

- **Needs of organizations, geographic regions, and society-at-large –**
  - **Willingness to partner** – Need for working together to gain mutual benefits not available effectively or efficiently when working separately.
  - **Access to competence** – Need for continuously well prepared workers, family members, and community contributors leading to economic and social development and improved quality of life.

- **Attend to long- and short-term benefits** – Addresses both the short- and long-term needs of the groups who are to benefit from career and technical education.

<u>Learning Signature for Career and Technical Education</u>

QUESTION: In view of the design features already recommended, what should be the design features of the learning signature (e.g., story, phrase, picture, song, object, person) that communicate the uniqueness or special nature of career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning signature are consistent with and supportive of the design features recommended for other design elements.

- **Create an accurate image** – Is authentic to the aims, operation, and accountability of career and technical education; is real in terms of how career and technical education goes about its operation.
  - **Include as essential defining concepts –**
    - Balanced attention to knowledge and skills.
    - Learner-centeredness.
    - Link to real work, family, and community life.
  - **Include as important defining concepts –**
    - Building network of relationships and opportunities.
    - Reaching ever-changing high standards.
    - Sustaining human potential and quality of life.

- **Develop a common understanding and ownership by stakeholders** – Is easily understood by and rallies all groups holding an interest in career and technical education, including learners, staff, and wider community.

- **Provide a unique character** – Highlights the specialness of career and technical education and distinguishes it from other educational programs.

- **Confirm a worthy identity** – Affirms a morally and intellectually justifiable focus for career and technical education.

- **Integrate consistently into the operation of the institution** – Is woven into and radiates from all elements of career and technical education operation.

- **Give focus and coherence to all components** – Unites all elements of career and technical education in a common purpose.

- **Include all learners** – Affirms, embraces, and affects the spirit of all learning audiences served by career and technical education (e.g., young and old, female and male, poor and rich, all ethnic groups).

- **Communicate powerfully an unbroken chain of commitment (the promise)** – Is a forceful and energetic symbol of career and technical education.

Learning Expectations for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning expectations (i.e., results, outcomes, standards) for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning expectations are consistent with and supportive of the design features recommended for other design elements.

- **Includes achieving academic, employability, and specific occupational knowledge and skills.**
  - **Academic knowledge and skills** – Includes knowledge and skills in language, mathematics, science, social studies, and arts.
  - **General career and technical knowledge and skills** – Includes knowledge and skills needed in all work, family, and community roles and responsibilities, including:
    - **Life Planning** – Knowing self and choosing responsibly; interrelating work, family, community, and personal life; caring for personal wellness; working safely.
    - **Relationships** – Collaborative intelligence; understanding organizations; understanding diversity; relating interpersonally.
    - **Technology** – Using technology (as aid, content, context).
    - **Managing** – Managing resources; managing time; setting expectations and evaluating progress; making decisions; planning and organizing; recognizing and resolving problems; taking action; being able to engage; being entrepreneurial.
    - **Work Ethics** – Practicing ethical and moral habits in work, family, and community life.
    - **Continued Learning** – Learning to learn (and unlearn); self-sustaining.

  - **Specific career and technical knowledge and skills** – Includes knowledge and skills needed for particular work, family, and community roles and responsibilities (i.e., in the context of work roles, these knowledge and skills are those needed in specific occupational clusters and jobs and all aspects of the industries where the jobs are located).

- **Communicate clearly and concisely the results or standards expected and promised** – Makes straightforward and coherent statements of what learners are expected to accomplish.

- **Involve reaching for a meaning of educational excellence that provides challenges and opportunities** – Addresses the highest and most rigorous expectations for what it means to be an educated person from a career and technical perspective—even beyond what is easily measured.

- **Direct attention towards changing context and challenges of life upon entering the 21st century** – Is future-oriented and leads to action as relates to the problems and opportunities in work, family, and community life.

- **Survive challenges from key internal and external stakeholders in career and technical education** – Seeks examination and support by stakeholders in career and technical education (i.e., students, staff, business and industry, organized labor, other educational institutions, community, professional associations, accreditation agencies).

- **Prepare learners to be active change-agents in improving the future state of affairs in society** – Prepares learners to be engaged in improving the quality of life in our culture—particularly as relates to work, family, and community roles and responsibilities.

- **Contribute to lifelong learning** – Enhances competence to continue to learn, integrates new learning with past learning, and encourages further learning.

- **Represent balanced attention to all areas of human talent and development** - Addresses all areas of competence and skill (i.e., occupational, academic, aesthetic, social).

- **Address key life places (i.e., personal, work, family, community)** – Addresses the roles and responsibilities of personal, work, family, and community life.

<u>Learning Process for Career and Technical Education</u>

QUESTION: In view of the design features already recommended, what should be the design features of the learning process (i.e., curriculum content, instructional methods, assessment strategies) for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning process are consistent with and supportive of the design features recommended for other design elements.

- **Build a progressive path to achieving external standards** – Has clear desired end results and fosters continuous progress toward these results, leads to meeting demanding academic, general and specific, career and technical learning expectations that are recognized by further education institutions and business and industry, and includes independent assessment of learning expectations.

- **Engage learners in relevant and challenging experiences** – Instills excitement, is self-motivating, brings out best talents and performance, inspires commitment, opens opportunities, appears doable, provides needed support, is enjoyable, is demanding, connects to learner's vision of future, and engages the learner in knowledge building.

- **Be learner-centered** – Personalizes to the needs and prior learning experiences of each and every learner, closely connects teaching and counseling/student support services in advance learning and career development, allows learners to select from multiple learning strategies to reach learning expectations, provides just-in-time and just-for-you learning experiences, includes multiple entry and exit points, is managed by the learners with guidance by staff, and leads learners to connect learning from different sources and construct a coherent view of their world.

- **Use real-life applications** – Connects directly with business and industry and other life contexts; includes internships in employment context; reflects community needs and interests; and involves external audiences in planning and execution.

- **Integrate academic learning with career and technical learning** – Integrates and relates academic with career and technical education as it is needed in the context of work, family, and community roles and responsibilities.

- **Use and closely coordinate non-school and school learning settings** – Makes ample use of multiple learning settings in and out of the school (i.e., workplace, home, community) and careful planning and supervision of learning in non-school and school settings.

- **Use project-based learning** – Uses real projects drawn from needs external to the educational institution; results in products valued outside of the school or college; and encourages learning projects to be initiated and managed by the learners.

- **Involve teachers as guides and facilitators** – Recognizes and values contribution of learners and importance of involving learners in managing the learning; is directed by staff (as navigators) who are up-to-date with subject matter, its application, and use of information technology in learning.

- **Apply continuous and multiple forms of assessment to improve learning** – Uses frequent, immediate, and a variety of assessment and feedback strategies to improve the learning experience.

- **Create and nurture learning communities** – Creates and nurtures a sense of community by fostering close interaction of learners with other learners, teachers with learners, and teachers with other teachers; involves abundant cooperative learning; uses peer teaching; and blends learners of different ages and experiences.

Learning Organization for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the organization (i.e., organization of students, staff, time, learning setting, subjects, decision making) for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of the learning organization are consistent with and supportive of the design features recommended for other design elements.

- **Organize students so there can be:**
  - Learning that is learner-centered for each student and based upon external standards (i.e., business and industry, further education) and accountability for individual success.
  - Learning in teams and cohorts within and across subject, using project-based learning and learning communities.

- **Organize time to:**
  - Result in achievement of necessary levels of competence and attainment of work, family, and community standards and benchmarks.
  - Take advantage of solid academic, career and technical, and continuing education study and work, family, and community experience.

- **Organize learning settings to:**
  - Allow learners access to mentors, coaches, experts, and authentic context; learning settings are flexible and centered around the learning experience.
  - Allow learners access to a variety of settings (i.e., formal, informal, self, small groups, large groups, on-line, studios, in school/college, in business, in community).

- **Organize subjects or fields of study to:**
  - Have learning lead to competence needed in work, family, and community roles and responsibilities.
  - Integrate the various subjects.

- **Organize staff to:**
  - Co-facilitate learning with students and others, and model collaboration.
  - Integrate learning across subjects, professional roles, and learning settings.

- **Organize decision making to:**
  - Coordinate learning among all education levels (i.e., K–12, community college, university).
  - Involve learners in the decision-making process.

Learning Partnerships for Career and Technical Education

The recommendations regarding learning partnerships for CTE address the questions of: (1) Who should be included as a partners for CTE? (2) What are the mutual benefits to students, partners, and CTE? and (3) What are the desired features of the partnerships?

CTE Partners

QUESTION: In view of the design features already recommended, what should be the makeup of learning partnerships for career and technical education at the secondary and postsecondary levels?

- **Internal to educational institution:**
  - Faculty/teachers/instructors.
  - Counselors/student services.
  - Administrators and staff.
  - Students.

- **External to educational institution:**
  - Business and industry.
  - Parents.
  - Policy makers (local, state, federal).
  - Communities.
  - Trade associations/professional organizations.
  - Other educational institutions.
  - Colleges of education.
  - Labor unions.
  - Social service agencies.
  - Government (local, state, federal).
  - Community-based organizations (e.g., Rotary, Kiwanis)

Mutual Benefits to CTE Partners

QUESTION: In view of the design features already recommended, what should be the mutual benefits to career and technical education, partners, and students within learning partnerships for career and technical education at the secondary and postsecondary levels?

- **Benefits provided to career and technical education from partners:**
  - Expertise and leverage for change.
  - Authentic learning contexts.
  - Facilities.
  - Staffing assistance.
  - Funding of programs and students.
  - Employment for graduates.
  - Innovative ideas and renewed energy.
  - First-hand information of how business/industry works, and educational pathways that make sense from one level to another.

- Up-to-date equipment, facilities, work processes, and faculty mentorships to provide ability to stay at the cutting edge of industry.
- Content for learning experience to enhance student learning.
- Support and endorsement.
- Work experience.
- Enabling legislation.
- Support from government infrastructure.
- Instructional materials.

- **Benefits provided to partners from career and technical education:**
  - Skilled workforce, families, and communities.
  - Opportunities to learn about new developments in education and the professions.
  - Relevant learning experience and ability to certify or credential employee learning in a meaningful way.
  - Increased revenue (taxes).
  - Facilities and equipment for use in training.
  - Willingness to make needed organizational and program changes.
  - Access to flexible training opportunities.
  - Reduced cost of training (e.g., shorter time to reach productivity).
  - Students with the prerequisite skills for continuous learning.
  - Up-to-date educational staff.
  - Opportunity to access the education network.

- **Benefits to students from partnerships:**
  - Family that is informed and educated about value of CTE.
  - Help with decision making in identifying and designing a career path.
  - High expectations of student by others and self.
  - Opportunity for internships in area of career choice.
  - A personal mentor from world outside school.
  - Access to privileged places of learning.
  - Genuine commitment for lifelong learning, and opportunity and resources to pursue.
  - Help in dealing with the challenges that the learner faces, which may require several partners who are cooperating.
  - Appreciation for and valuing of what the learner brings to the learning experience.
  - Access to safe and secure learning environments (i.e., physical, social, psychological).
  - Accurate and accessible information on the cost of learning and support services available.
  - Time for and practice at learning the culture of the educational institution.

Partnership Features

QUESTION: In view of the design features already recommended, what should be the design features of learning partnerships for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning partnerships are consistent with and supportive of the design features recommended for other design elements.
- **Focus on enhancing student learning** – Focuses primarily on meeting student needs and learning.
- **Collaborative, mutually beneficial relationship** – There is reciprocity in short- and long-term gains by all partners, and sharing of common goals and values.
- **Working through partnerships as the regular way of operating** – The use of partnerships is always an early consideration in the operation of the educational institution, and everyone is involved in forming partnerships.
- **Agreement to continuous evaluation, re-thinking, and innovation** – There is willingness and energy for improving the partnership over time and, with a changing context, willingness to draw the partnership to an end when appropriate.
- **Joint commitment and engagement** – There is tangible agreement to be fully engaged in working and investing together on continuous bases.
- **Clear roles and contributions** – Specific roles and responsibilities are clearly established and supported by all partners.
- **All needed partners are represented and deliver on promises** – All partners are active in the partnership and have ability to deliver on their commitments.
- **Time and funding is committed for planning and communications among partners** – The resources to sustain the partnership are provided by all those involved.
- **Timely sharing of information** - Information sharing is planned, monitored, and flows easily and openly in a timely manner among partners.

<u>Learning Staff for Career and Technical Education</u>

The desired features of the learning staff for career and technical education include attention to the questions of: (1) Who should be included among the staff? (2) What staff competencies are needed? (3) What staffing strategies should be included? (4) Which staff development providers should be considered? (5) What are the desired features of staff development? and (6) What are the desired features of leadership for career ahd technical education?

CTE Staff

QUESTION: In view of the design features already recommended, what should be the makeup of the learning staff for career and technical education at the secondary and postsecondary levels?

- **Learners** (students; present and former).
- **Certified faculty** (academic and CTE).
- **Workers** (i.e., employers, supervisors, mentors, exemplary workers involved in work-based learning).
- **Community agents** (e.g., professionals in the community).
- **Partners.**
- **Experts** (knowledge-based *and* skilled-based) in the subject.
- **Staff teams** (i.e., faculty, administrators, counselors; school- and work-based; across subjects).
- **Support staff.**
- **Administrators.**
- **Counselors and other student services.**
- **Policy makers.**

Staff Competencies

QUESTION: In view of the design features already recommended, what should be the design features of the learning staff competencies for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning staff are consistent with and supportive of the design features recommended for other design elements.
- **Knowledge of subject matter (learning expectations)** – Includes knowledge and skills such as theory and application to work, family, and community roles and responsibilities; certification by external organizations such as industry and professional associations; varied and in-depth experience in work, family, and community roles; all aspects of the industry; general career and technical skills and knowledge such as workplace readiness/employability skills; needs for work, family, and community roles and responsibilities; academic foundations and basic skills; and interrelationships of work/family/community life.

- **Know about making learning authentic and contextualized** – Is able to relate learning to real situations outside of school/college in terms of planning and assessing learning experiences.

- **Able to guide learning (i.e., faculty, counselor, designer)** – Includes skills such as focusing on learning expectations, responding to diverse learners, designing instruction (both formal and informal), pre-planning and just-in-time instructional responses, assessing learning, using information technology, integrating curriculum, guiding cooperative and project-based learning, and coordinating school- and work-based learning.

- **Work in teams and as partner** – Includes skills such as collaboration, teamwork, interpersonal skills, and fostering partnerships to bring in specialized expertise.

- **Be creative and entrepreneurial** – Includes skills such as risk-taking, being courageous and visionary, willingness to try new ideas, and troubleshooting to improve learning.

- **Will continue to learn** – Includes skills such as commitment to being up-to-date, continually improving practices, being lifelong learner, being flexible and proactive, recognizing the importance of staffing effectiveness of CTE; valuing and contributing to regular assessment of their practice; seeing lifelong learning as a shared responsibility of individuals and institutions.

- **Lead in and use continuous quality improvement** – Staff applies continuous quality improvement (i.e., plan, act, collect data, reflect) to the learning experience and program with expectations of excellence that are constantly updated, performance that is continually assessed, and rewards and recognition that are closely linked to meeting expectations.

- **Willing and able to take leadership** – Staff takes on leadership roles when needed from a variety of positions.

- **Able to train others to do training** – Staff knows how to train-the-trainer.

Staffing Strategies

QUESTION: In view of the design features already recommended, what should be the design features of the staffing strategies for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of staffing strategies for learning staff are consistent with and supportive of the design features recommended for other design elements.

- **Form partnerships with sources of teaching skills** – Includes business and industry, labor, professional associations, technical and community colleges, between secondary and postsecondary institutions, universities, and accreditation agencies as potential partners.

- **Develop compensation plans for faculty in concert with collective bargaining units in order to compete for their skills in the labor market** – Includes consideration of separate pay scale for career and technical education teachers, bonuses, stipends, and contracting with industry for joint appointments.

- **Use faculty skills from other than career and technical education faculty** – Uses the teaching skills of other staff through cross-training (i.e., academic faculty, counselors).

- **Develop additional ways to obtain needed teacher training** – Includes making teacher training more self-directed and using distance delivery.

- **Develop additional funding sources for faculty and faculty training** – Includes increased tuition for career and technical education courses, fees for services provided through career and technical education facilities and staff, and partnerships with sources of teaching skills.

- **Make use of current students** – Includes using more skilled and experienced career and technical education students (youth and adult) to do peer training and provide assistance to teachers.

- **Identify what competencies each group of staff needs** – Identifies the specific roles for each source of staffing identified above.

- **Attract former students** – Includes recruiting former students and assisting in their faculty training (i.e., "grow your own").

- **Provide succession plans for staffing** – Systematically plans for filling positions of staff that will be leaving.

Staff Development Providers

QUESTION: In view of the design features already recommended, who should be the staff development providers for career and technical education at the secondary and postsecondary levels?

- Professional associations.

- Business and industry.

- Consortia arrangements among institutions.

- Internet.

- In-house training programs.
- Consultants.
- Colleges and universities.
- Learners (alone, in self-organized groups, and study circles).
- Peers and colleagues.
- Community agencies and organizations.

Staff Development Features

QUESTION: In view of the design features already recommended, what should be the design features of staff development for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of staff development for learning staff are consistent with and supportive of the design features recommended for other design elements.
- **Relevant and valuable** – Provides high-quality information, access to key people, is current and cutting edge, uses flexible delivery methods, is just- in-time; provided by very competent staff—dynamic, provocative, challenging, and flexible.
- **Direct connections to business and industry** – Provides connections to business and industry through location of training, support, and credentialing; addresses all aspects of industry and learning through, about, and for work.
- **Give high priority** – Is important to the educational institution, provides sustained support, incentives, and sufficient resources; provides short- and long-range plans; and is viewed as investment rather than short-term expense.
- **Integrate with vision and operation of educational institution** – Is closely coordinated, coherent, and imbedded with the mission, vision, needs, values, priorities, plans, and constraints of the educational organization; is accessible when and where needed; and is supported and modeled in the organization's leadership.
- **Model use of continuous quality improvement strategies** – Has built-in processes and tools for assessment and adjustment, and uses flexible delivery options.
- **Make use of distance delivery and computer enhanced learning** – Includes learning for staff through use of remote sites, supported by information technology.
- **Owned by staff** – Is based on self-identified needs, self-directed, gives considerations to all staff, grounded in local capacity, responsive to individual development plans, and linked with accountability that is addressed by all who are involved.

- **Model of CTE reform initiatives** – Demonstrates initiatives such as state-of-the-art teaching and learning, curriculum integration, contextual learning, and partnerships between industry and educational institutions; and sustained over time.

Learning Leadership

QUESTION: In view of the design features recommended, what should be the design features of the leadership for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning leadership are consistent with and supportive of the design features recommended for other design elements.
- **Knows career and technical education** – Knows the history, traditions, mission, operation, and finance of career and technical education.
- **Entrepreneurial, creative, risk-taking** – Is willing to be bold and open to educational change and reform.
- **Engaged in and supports professional development** – Seeks continuing professional development for self and others.
- **Willing to partner** – Is enthusiastic about working with wide range of partners in advancing career and technical education.
- **Empowering of others** – Has participatory, collaborative, and shared leadership style.
- **Supports integration of academic and career and technical education, and articulation of secondary and postsecondary education** – Advocates and supports major education reforms relating to career and technical education such as curricular integration and program articulation.
- **Committed, has passion for, believes in, and advocates for career and technical education** – Is strong supporter of career and technical education.
- **Has vision and able to communicate it** – Possesses vision for field of career and technical education and is able to communicate it effectively.
- **Able to lead change** – Is competent in leading transformation of career and technical education.
- **Able to manage accountability** – Supports and encourages use of assessment to insure accountability.

Learning Environment for Career and Technical Education

The desired features of the learning environment for CTE included attention to both learning technology and learning facilities.

Technology Features for CTE

QUESTION: In view of the design features already recommended, what should be the design features of learning technology for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning technology are consistent with and supportive of the design features recommended for other design elements.

- **Enhance learning** – Solves problems; produces products; adds new functionality; develops new skills; saves time; is appropriate to purpose; is a learning tool; supports (not drives) learning; encourages more advanced learning; and provides additional ways to learn; responds to new reform initiatives such as project-based learning, collaborative learning, authoring, inquiry and knowledge construction, higher order thinking, animation, integration of curriculum, and creativity; centers on learners by being adaptive to individual needs; supports self-directed use; bridges to the future; and is capable of customization.

- **Increase accessibility** – Is affordable; available to all those who can benefit from it; is in sufficient quantity; is easy to use (level of difficulty should be in line with purpose); is close at-hand; has no barriers; is distributed; is personalized; is portable; provides user-friendly training and technical support when needed; requires low maintenance and overhead; is easy to troubleshoot and repair; and is easy to update and upgrade.

- **Tie to industry standards and expectations** – Is on par, up-to-date, and compatible with what is in use in business and industry, and promotes adapting to and using new advances in technology.

- **Facilitate communications and relationships** – Helps make connections; locates, filters, and interprets information; bridges time and distance; helps find others with similar interests and needs; stimulates teamwork; supports social networks; taps into new resources; promotes collaboration; and includes responsible use of technology from legal and ethical perspectives.

- **Encompass a wide range of tools, equipment, and software** – Recognize that learning technology is broadly conceived and includes much more than computers and other information technology.

- **Be affordable and sustainable** – Leads to sound investments (e.g., right time, right equipment and software, right price) for short- and long-term; includes partnerships to assist with sustainability; and breaks down barriers to joint use such as cultural and organizational turf.

Facilities Features for CTE

QUESTION: In view of the design features already recommended, what should be the design features of learning facilities for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning facilities are consistent with and supportive of the design features recommended for other design elements.

- **Be learner-determined** – Fits the learner, is least restrictive, and involves the learner in its design; creates a feeling of being owned by students and staff, of being at home, and having lifelong connection to the learner; gives the learner a sense of identity, sometimes associated with place—but increasingly with the learning signature and with what is learned and how it is done; assumes and supports informal learning; is responsive to the needs of learners who vary in age, socioeconomic status, cultural background, prior learning experiences, full-time vs. part-time status, and learning style; and supports learning by staff as well as students.

- **Be flexible and adaptable** – Facilitates change, adjustment, reconfiguration, and variety depending on needs; is readily able to shrink or expand as needed; gives careful attention to adjacencies needed for learning; provides rich variety of spaces and furnishings.

- **Facilitate and support learning communities** – Supports taking learning anywhere and anytime, integrates staff and students, provides for gracious food service and relaxation; fosters close relationships among and between learners and staff; and supports and encourages informal learning and the productive interaction of informal and formal learning.

- **Blend with work, family, and community places** – Connects to, replicates, uses, and provides opportunity to experience work, family, and community places; contributes to being a seamless extension of the learner's life environments; includes consideration of all of the possible settings that can support the desired learning experiences, which includes, but is not limited to, school buildings; makes strong and visible connections among learning settings; supports reciprocity among settings; and made up of carefully constructed, yet dynamic and constantly changing, patterns of settings needed for effective learning experiences.

- **Support major reform initiatives** – Provides the variety of spaces and equipment to readily support project-based learning; encourages and facilitates the close linkage of career and technical education and academic education; encourages and facilitates linkage of career and technical education in high schools and colleges; and provides multiple and ready access to learning technology.

- **Be community-centered** – Takes into account culture of community, builds community, is a center of the community, is used by the community, and is welcoming to the community.

- **Be stimulating, uplifting, and dynamic** – Encourages creativity and growth, is beautiful and respected, is provocative of imagination, responds to self-planning, and supports life balance.

- **Serve as a learning tool** – Provides opportunities for learning by exposure of facility's infrastructure (e.g., plumbing, electrical, heating, communications).

- **Enhance and fit with natural environment** – Mirrors and contributes to natural surroundings and places for relaxation and rejuvenation; and contributes to ecological sustainability.

Learning Accountability for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning accountability (i.e., measures, indicators, reporting strategies) for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning accountability are consistent with and supportive of the design features recommended for other design elements.

- **Insure significant and meaningful consequences when outcomes are met or not met** – Has consequences that matter to organizations and individuals involved in and responsible for career and technical education.

- **Based on shared mission, vision, goals, and values** – Derives from commonly shared and agreed upon in advance mission, vision, values, goals, and responsibilities involving local, state, and federal perspectives, and reflects continuous quality improvement in changing environments; has buy-in from students, staff, and other stakeholders; and leads to leveraging of energy, support, and resources.

- **Reflect attention to areas of advocated reform in career and technical education** – Includes integration (alignment) of academic and CTE; articulation of secondary and postsecondary levels; coordinating work- and school-based learning; career pathways; improved achievement; obtaining certificates, degrees, and credentials; and work placement and work advancement.

- **Adapt accountability to changing environments** – Provides for changing accountability requirements with changes in social, economic, and political context; takes long-term perspective; and sometimes is willing to go slowly to reach long-term goals with accountability.

- **Align with funding levels, shares, allocation strategies, and incentives** – Links the flow of resources to accountability in ways that connect and contrast costs and benefits, and reinforces improving career and technical education; closely monitors progress toward expectations; and coordinates accountability requirements among institutional

processes and funding sources; aligns structural architecture with accountability provisions.

- **Address student, community, state, and national needs** – Responds to combined needs of students, community, state, and national interests through providing and supporting multiple degrees of participation and ways to benefit from career and technical education.

- **Include principles of continuous quality improvement** – Uses the processes and techniques of continuous quality improvement/total quality management.

- **Have a clear purpose** – Includes purpose of program improvement and financial auditing that are explicit beforehand and based upon the end result; provides overall plan for accountability where component parts fit into a whole plan.

- **Develop realistic outcomes and indicators jointly** – Follows from coordinated effort by local, state, federal educational agencies and other partners to be clear and realistic in terms of measures, processes, and timelines; leads to alliances; and is not self-serving.

Learning Celebration for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning celebrations (i.e., traditions, rituals, recognitions) for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning celebrations are consistent with and supportive of the design features recommended for other design elements.

- **Express and build commitment to and ownership of mission, vision, values, and signature of career and technical education** – Links in meaningful ways to mission, vision, values, and signature of the learning experience; builds sense of community; strengthens ownership in the program by students, staff, and other stakeholders through recognition of value added and high standards; and identifies and deals with barriers.

- **Have genuine value in commemorating meaningful accomplishments** – Are significant to those being recognized, and enjoyable to all those participating; are meaningful and sincere events that contribute to the learning experience.

- **Emanates from, as well as creates, learning cultures** – Recognizes continuous growth and renewal in various ways in the educational enterprise—from old and new learning cultures and from within and outside of educational institutions; rooted in career and technical education culture as well as helping to advance culture, and thereby connecting past, present, and future.

- **Conduct at multiple times and ways during a program** – Happens at the beginning, at milestones along the way, at end of career and technical education, and in a wide variety of ways—from simple applause and display to major public events; pays attention to timing and need for continuous encouragement; uses impromptu events and seeks missed opportunities for recognition; makes efforts to include locating some celebrations in the wider community; and uses media to expand and strengthen celebrations.

- **Include all contributors to the learning experience** – Includes regular systems of recognizing learners, staff, partners, and community as individuals and groups; and makes special effort to invite others, both internal and external, to the organization.

- **Recognize external standards and benchmarks** – Based on expectations drawn from outside the educational institution.

- **Include constant display of learning projects and products** – Gives attention to the involvement in projects and their tangible results, such as achieving outcomes and mastery of competencies.

- **Provide continuous motivation and incentives for all learners and staff** – Encourages and supports improved learning and performance.

- **Have enough variety so everyone is included at some time** – Provides positive encouragement and reaches to all learners, and are conducted in multiple ways and times.

Learning Finance for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning finance (i.e., cost reduction, revenue enhancement) for career and technical education at the secondary and postsecondary levels?

- **Align with features of other design elements** – Assures that the design features of learning finance are consistent with and supportive of the design features recommended for other design elements.

- **Link funding directly and closely to accountability and consequences** – Shows return on investment; aligns programs with actual work, family, and community needs in ways that are sustainable; uses continuous program review, and prunes less productive programs; uses cost/benefit and unique need information in making program decisions; establishes clear expectations; and links risk, responsibility, performance, and rewards everywhere.

- **Be innovative** – Encourages thinking "outside of the box" as relates to finances (e.g., relations between labor and management, full-time and part-time staffing); encourages entrepreneurship; supports re-engineering; and encourages flexibility, process documentation, and courage to experiment with and redesign institutional processes.

- **Focus on priorities** – Constantly pays attention to educational priorities, makes distinctions between high and low importance and what should stay and what should change or go, identifies necessities, and reserves resources "off the top" for new high-priority initiatives before budgeting other matters.

- **Use sound fiscal policies and management and report to all stakeholders** – Identifies areas of efficiency and inefficiency; constantly examines how "you are doing business"; analyzes cost to the customer in terms of value and market, and prices accordingly; and employs information technology to improve financial practices.

- **Utilize systems thinking when seeking resources from partnerships** – Creates a systems-thinking approach to seek and integrate innovative resources from diverse sources; and builds solid cooperative relations with partners (i.e., other educational institutions, business and industry, social service agencies, government) where there are mutual gains and costs that can be shared or shifted; and constantly is on the lookout for new partners.

- **Do long-term thinking and financial planning** – Examines long-term costs and benefits with learner and community needs in mind, thinks in terms of investment strategies regarding both costs and benefits, and projects budgets and contingency plans 3 to 5 years into the future.

- **Focus on role of career and technical education in the system of workforce and economic development** – Builds and uses a systems approach in considering how career and technical education can complement other components of the workforce and economic development "system" (i.e., considers relationships of welfare to work, industry retraining programs, Tech Prep, School-to-Work), and identifies specific roles, contributions, benefits, and funding streams.

- **Aggressively seek resources from diverse sources** – Develops funds through effective marketing, student retention, grants and contracts, foundations, sales of products and services, leasing vs. buying, joint ownership, partnerships, and importing vs. owning programs.

- **Promote efficiency in learning** – Allocates resources based on value added, eliminates waste in funding use, and constantly looks for cost savings involving input from students, staff, and other stakeholders.

PART II: DESIGN PROCESS FOR IMPROVING CAREER AND TECHNICAL EDUCATION

The design process advocated for use in designing career and technical education in high schools and community and technical colleges was developed over many years and applications of *New Designs for Learning* (Copa, 2002). The process strives to provide a framework and strategy for an institution to reach for and grasp its vision for the learning experience. The process has two central dimensions: Design Principles and Design Elements.

The design elements have been described earlier, in the first part of this report, and are shown in Figure 1. The elements were used to identify and organize the recommended operational features of career and technical education at the secondary and postsecondary levels. The design process follows the specified sequence shown in Figure 1 to achieve careful alignment among the elements and to place "first questions first." The idea is to ensure that the design fits the needs of the local situation, and proceeds in a logical order from aims to actions to supporting structure, processes, environment, and needed resources. The design process has emerged from research and best practices, as well as the experience of working with several schools and colleges across the United States and in other countries. No doubt, it will continue to change with more experience and as changes occur in the learning context. While the process is presented in a linear fashion, focusing on the most important questions first, there is also a need to move upwards and across all elements in the design process in order to gain the careful alignment needed for high quality and efficiency.

Principles Guiding the Design Process

The principles that guide the design process serve as foundational assumptions or presuppositions to the way one goes about the process. The key principles are as follows:

- **Involve and trust stakeholders** – Closely involve those who have a stake in the educational institution, and trust that they will act wisely.
- **Design down and check up** – Ask the most important questions first and align responses to later questions accordingly; check back among questions and answers to see that there is coherence and consistency.
- **Address "the whole"** – Consider all elements of the institution, rather than focusing on only one area, as many of the elements and features are interrelated.
- **Build on assets** – Every institution has some areas of strength within its borders and among its partners and external stakeholders: use these to advantage in the design process.
- **Look outside** – Sometimes it is necessary to literally go outside (the institution) to achieve educational excellence.

- **Provoke and respect** – The process should raise questions and bring ideas and examples that provoke thinking and discussion, and respect those involved to make good decisions.

- **Think long-term** – Real institutional change takes a long time and involves many ingredients beyond new plans or designs, including leadership, staff development, and resources.

Design Process Steps

This section of the Design Guide focuses on using the project's recommendations, which are national in scope, for designing career and technical education programs in the more local context of a particular state or high school or community/technical college (or grouping of institutions). Essentially, the process is one of adapting or customizing the project's recommended desired features of career and technical education nationally to a more local context, contrasting the adapted features to the present features in the local context, and then identifying areas for action to improve the situation. The process is presented as a series of steps that will need attention.

Step 1: Determine Purpose and Scope

The first major step is deciding the purpose, scope, and time frame for the design process. Is the purpose and scope to decide on a new program or redesign of an existing program, major changes or renovations in a whole school or college, or design a new facility or whole campus? Will both foundational and operational features of career and technical education be addressed? Which of the operational elements will be included in the plan? And, how much time and resources are available to complete the process in addressing its purpose? Who will have to be involved for the planning to be successful? These questions need to be addressed before moving to the step of developing a design process that fits the situation at hand.

Step 2: Determine Design Process

The design process that will be used to address the purpose resulting from Step 1, above, should be clearly laid out ahead of its implementation. It should be made public, and comments and suggestions invited for its improvement. The process should consist of major purpose, activities, responsibilities, and timelines. Some of the key activities might include:

- Meetings of advisory groups.
- Individual and group interviews with key stakeholders.
- Written surveys of key stakeholders.
- Site visits to schools/colleges and business and industry.
- Public forums to share results.
- Writing reports.
- Presentations to decision-making groups.

A key aspect of the process is identifying what decisions will be made and who will be making them—most importantly who will be the recipients of the recommended action plan for new designs for career and technical education in the local context.

Step 3: Select Design Group and Steering Committee

The credibility and successful approval and implementation of new designs for career and technical education will depend on the selection and involvement of a Design Group that represents the major stakeholders in the career and technical education enterprise under design or redesign. Stakeholders may include students, families, school/college staff, other educational institutions, business and industry, organized labor, government, social service agencies, and alumni. Clearly, both secondary and postsecondary career and technical education should be represented, whether or not the career and technical education programs under study are secondary or postsecondary. The selection of the Design Group and Design Steering Committee membership should be made by the top administrator in the school or college for which the design process is being conducted. Experience at implementing this process suggests that at least one-half the Design Group be made up of individuals external to the school/college staff, and that it is critical to have students well-represented. The design group might involve 20–40 individuals, depending on the purpose and scope of decisions being addressed. From the Design Group, a small Design Steering Committee of four to six might be selected to be more intensely involved in directing the design process. The specific responsibilities of the Design Group and Design Steering Committee are:

Design Group Responsibilities:

- Attend and actively participate in all Design Group meetings.
- Make recommendations on all phases of the new design.

Design Steering Committee Responsibilities:

- Participate in all Design Steering Committee meetings.
- Advise on the direction, agenda, and activities of the larger Design Group.
- Identify and advise on all other activities (e.g., interviews, data gathering, public information) in support of the Design Group.

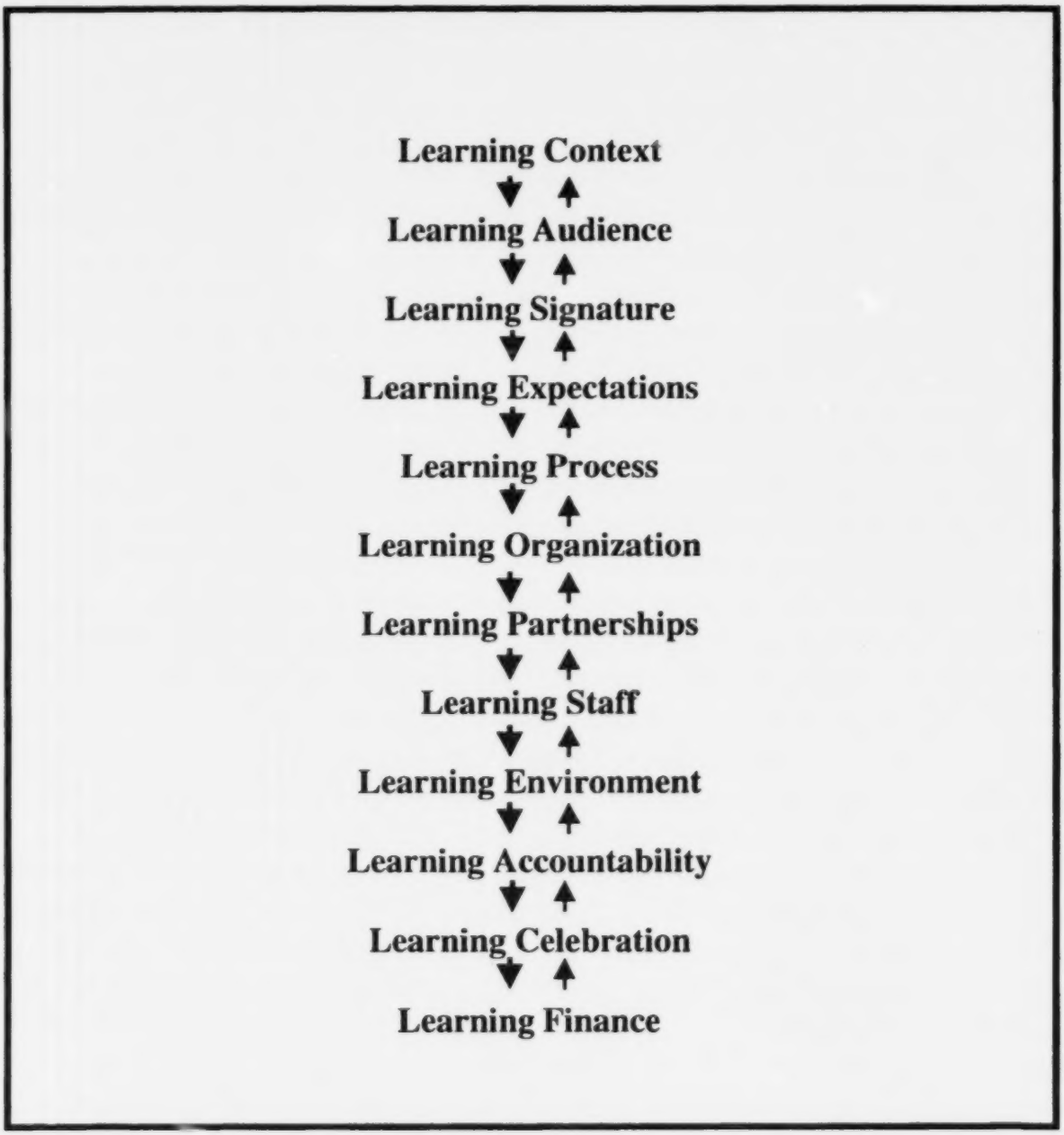

Figure 1. Design process (designing down and checking up) used in *New Designs for Learning* (Copa, 2002).

Step 4: Select Facilitator and Secure Technical Assistance

A facilitator will need to be selected to direct the meetings of the Design Group and Design Steering Committee and coordinate all other design process activities. This may be an individual already on the school/college staff or an external consultant, depending on the local context. The purpose and scope of the design process will suggest the amount of time and support needed by the facilitator. The facilitator should be selected by the same individual who selects the Design Group and Design Steering Committee. This individual must have excellent organizational, facilitation, and communication (oral and written) skills. The individual also needs to be very familiar with the recommendations and design process presented in this report. The person selected may also need technical assistance, which can be obtained at: http://newdesigns.orst.edu.

Facilitator Responsibilities:

- Prepare meeting agendas and supporting materials for Design Group and Design Steering Committee meetings.
- Facilitate meetings.
- Prepare a summary of each meeting.
- Design and coordinate/conduct/summarize data collection strategies (e.g., surveys, interviews).
- Prepare final design report.

Along with these facilitator responsibilities that are unique to the design process, the more general coordinative responsibilities include:

- Make all arrangements and provide space for Design Group and Design Steering Committee meetings.
- Communicate agendas, meeting summaries, and other project-related materials to Design Group and Design Steering Committee.
- Prepare written minutes and reports of each meeting.
- Arrange for school/college staff to be available to answer questions about current state of affairs in the areas being addressed by the design process.
- Provide appropriate support documents needed by the design process.

Step 5: Plan Internal and External Communications

An important aspect of the design process is to carefully plan to whom, when, and how communications will be made with those both internal and external to the school/college being addressed. Accurate and timely information in essential to avoid negative rumors and to build widespread student, parent, staff, and community support. Communications may take the form of

newspaper, radio, and television news articles; special newsletters; e-mail and regular mailings; presentations at organizational meetings; public briefings; and special Web pages attached to school/college Web sites.

Step 6: Hold First Meeting of Design Group

Usually, the design process will involve a series of meetings (e.g., 4–8) by the Design Group. These meeting may be one-half day to full-day in length. For each meeting, an agenda will need to be prepared in advance and reviewed with the Design Steering Committee. The agenda should be aligned with the design process determined in Step 2, above. The first meeting of the Design Group might have an agenda that includes the following:

11:30 a.m. – 12:30 p.m.
Introduction to the Meeting:

- Lunch.
- Greetings to participants.
- Introduction of participants.
- Charge to meeting participants.
- Questions.

12:30 – 12:50 p.m.
Overview of Planning Process:

- Background and overview of planning process.
- Details of planning process.
- Expectations.
- Questions.

12:50 – 1:30 p.m.
Review of Background Information:

- Review of background materials pertaining to purpose of design process.
- Questions.

1:30 – 1:45 p.m.
Break

1:45 – 3:30 p.m.
Learning Context:

- Purpose of learning context analysis.
- Reviewing some relative trends and initiatives.
- Illustrative learning context statements (from Part 1 of this report).
- Identifying and prioritizing assets, challenges, opportunities, and aspirations.
- Next steps.

3:30 – 3:45 p.m.
Break

3:45 – 5:30 p.m.
Learning Audience:
- Purpose of learning audience analysis.
- Illustrative learning audience features (from Part 1 of this report).
- Developing categories of users.
- Describing needs of users.
- Next steps.

5:30 – 5:45 p.m.
Continuous Improvement in Planning Process:
- Continuing concerns/information needs.
- Feedback on planning session.

5:45 – 6:00 p.m.
Plans for Next Meeting and Meeting Closing:
- Date and times for next design meeting.
- Agenda for next planning meeting—Learning Signature and Learning Expectations.
- Other plans.
- Meeting closing.

Step 7: Conduct Interviews, Surveys, and Site Visits

The design process may need to include conducting individual or small-group interviews with key stakeholders (or their representatives) to determine needs and gain feedback on emerging plans. In some cases, this can be done by developing, administering, and analyzing written surveys given in-person or via regular or e-mail. For interviews, an interview guide must be developed, interviewers selected and trained, and interviewees selected and arrangements made with them for interviews. Results of interviews will need to be analyzed and summarized in a format for use by the Design Group. The design process may also include site visits by the Design Group to observe the current state of affairs in the programs that are under study, in businesses and industries related to the programs, in higher education related to the program, and to exemplary programs in other schools/colleges. In each case, a clear purpose for the activity must be developed and shared, and arrangements made to make the activity a valuable contribution to the design process.

Step 8: Review Recommended Design Features and Related Design Reviews

The process of developing the desired features of career and technical education for a local context, using the recommendations from Part 1 of this report as a starting point, is one of selection, modification, and addition to the recommendations provided in Part 1. As noted earlier, in Part 1 of the report, much more detailed information pertaining to each recommendation and additional recommendations are presented in Appendix IV. For example, it may be helpful to see if the recommendation is categorized as *keep*, *bring to scale*, or *cutting edge*, as related to present level of application in career and technical education across the

country. For almost all recommendations, Appendix IV also provides a reference to related Design Reviews that summarize research, exemplary practice, and policy related to the recommendation. These reviews are available at: http://newdesigns.orst.edu. The reviews can be read on the site or downloaded for printing and use by the Design Group.

Step 9: Select and/or Adapt Design Features

First select those foundational and operational elements of the recommendations in Part 1 of this report that are to be addressed for the purpose of the design process being directed. Next, the features of the elements should be reviewed by asking the following questions:

1. Which features should be selected "as they are" to be desired features for our context?

2. Which features should be selected, with some modification, as desired features for our context? What modifications need to be made?

3. What, if any, features should be added (beyond the recommendations in Part 1) for our context?

This listing of features then becomes the desired features of career and technical education for the local context being addressed. The process can be repeated for each design element that has been selected to be included.

Step 10: Assess Program to Identify Gaps

The difference between the present features of career and technical education in the specific local context and the desired features developed in the previous step represent the design gaps that need to be closed to improve career and technical education. In order to gain a sense of this gap, the present features of the career and technical education programs in the local context must be assessed for each design element and each desired feature that was selected in the previous step. The assessment might be in narrative form or a simple quantitative scoring from 0 (no gap—present and desired features are the same) to 5 (significant gap between present and desired features). The validity of this gap rating can be improved by first-hand observation, data collection, experienced raters, and using multiple points of view (e.g., student, staff, business and industry, external teams).

Step 11: Prioritize Gaps for Action

Once gaps have been identified between present and desired features of CTE for each of the design elements under study, it may be necessary for reasons of time and resources to select a limited set, rather than all, for immediate action. There are several criteria that can be used to prioritize the design gaps for further action. Some of the typical criteria include: (1) costs and availability of resources to address the gap, (2) contribution of closing the gap to improvement of CTE, (3) readiness of those involved to take the needed action to close the gap, and (4) interrelationship of one gap and others (e.g., is there a natural sequence, will one hold up progress on others). Using these and other criteria, the Design Group can be involved in helping to prioritize and select those gaps that are to be addressed first in terms of improving CTE in the local context.

Step 12: Develop Action Plan to Close Gaps

Given a clear sense of the design gaps that are of highest priority to close in the interests of improving CTE in the specific local context of interest, the next step is to develop an action plan to close each gap. Action plans typically are quite focused and short-term (less than 2 years). These plans usually have components of goals, activities to reach goals, timelines, resources, and responsibilities. Goals and activities can be informed by benchmarking with other sites (i.e., identifying, studying, and adapting what is working for those who are closing similar gaps in other places) or designing one's own strategies. The Design Group might be supplemented by ad hoc individuals and task forces who are particularly knowledgeable and/or responsible for the gap under focus, to assist in developing action plans.

Step 13: Submit Action Plan for Approval

Once the action plans for new design for career and technical education in the local context have been finalized by the Design Group, they should be submitted to the decision makers identified in Step 2, above. A written report usually needs to be accompanied by an oral presentation and opportunity for discussion—often with a public school board or board of trustees.

Step 14: Celebrate and Disband the Design Group

With completion and approval of the action plans resulting from the work of the Design Group, an appropriate closure needs to be planned for the Design Group. Often in the form of a celebration event, this step may include individual letters and plaques recognizing contributions and public tributes. These activities are important to building ownership, commitment, and advocacy for the action plans—usually very important to the approval and implementation of action plans.

Step 15: Monitor Implementation of Action Plan

Monitoring implementation of action plans throughout implementation to see if the actions are being effective in closing gaps and making needed changes is critical to the design process. Often the Design Group will ask to be kept informed of the implementation progress on their recommendations, who is to be held responsible for implementation, and what recourse they will have if implementation is not taking place in the direction and timeline they have recommended. This step should be anticipated and addressed before the Design Group disbands.

CLOSING SUMMARY

This Design Guide is intended to be of use in improving career and technical education in high schools and community and technical colleges across the United States. It has set forth a series of recommendations describing effective career and technical education for both foundational and operational elements of policy and practice. Recommendations have been validated by peer judgment of leading practitioners of career and technical education from across the country and linked to reviews of related research, policies, and exemplary practices, and they have been examined for internal consistency, coherence, and alignment. A detailed 15-step design process has been provided to adapt these recommendations for use by states and local schools and colleges to their unique situations and needs. A Web site (http://newdesigns.orst.edu) with resources and contacts has been set up to support the adaptation process. The pathway is now readily available for the improvement to begin in earnest at the thousands of sites where career and technical education takes place in the United States.

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APPENDIX I.
PROCESS FOR DEVELOPING RECOMMENDED DESIGN FEATURES FOR CAREER AND TECHNICAL EDUCATION

The design recommendations set forth in this report for the United States and serving as the base for adaptation to a local context were developed over a 30-month period using a National Design Group; a series of four National Design Studio workshops; an Internet-supported design learning community; approximately 150 design reviews summarizing the research, policies, and exemplary practices relating to each design element; and intense work by the project staff. Each of these aspects of the project is briefly described below to give validity and trustworthiness to the project's recommendations.

National Design Group

The National Design Group was selected to represent both secondary and postsecondary career and technical education and their interrelationship from a variety of perspectives (i.e., teacher, counselor, local and state administrator, teacher educator, researcher, educational planning and architecture, and business and industry). The members of the Design Group were selected through a nomination process based on reputation for leadership, knowledge and experience, and support and commitment to career and technical education. Special attention was given to insure representation by gender, ethnicity, geographic location, and a range of knowledge of and experience with the prior work of the National Research Center for Career and Technical Education on new designs for learning at the high school and community/technical college levels. The role of the National Design Group was to: (a) stimulate divergent and convergent thinking about the future of career and technical education, (b) make sure thinking and recommendations were grounded in current reality, (c) represent a variety of perspectives on career and technical education, (d) provide direction to the project, (e) add credibility to the project's recommendations, and (f) assist in insuring impact by the project. The listing of National Design Group members is provided in Appendix II. The group met six times for 2-day meetings, each addressing two or three of the design elements. They had access to relevant Design Reviews produced by the project staff. Each meeting also entailed site visits and/or presentations focused on leading thinking and exemplary practices relating to the elements under discussion. The listing of sites and presenters is provided at: http://newdesigns.orst.edu.

Design Reviews

Another major component of the project was a review of research and exemplary practices relating to each design element being addressed. Literature and other materials reviewed were identified through electronic searches, suggestions from the National Design Group, professional association Web sites and publications, legislative updates and activities, and scanning of national conference programs related to secondary and postsecondary education—particularly those focusing on career and technical education.

The review and syntheses were developed in the form of a series of two-to-three page Design Reviews that were used to brief the National Design Group to enhance their discussions and insure that their recommendations were at the forefront of research, policy, and exemplary

practice. The design reviews were also used with the National Design Studio workshops and other dissemination and technical assistance activities. About 150 Design Reviews were developed and will be available as a separate publication, *New Designs for Career and Technical Education at the Secondary and Postsecondary Levels: A Compendium of Design Reviews of Related Research, Policies, and Exemplary Practices*. Through the reviews, approximately 1,400 references were examined during the project for implications for the design of career and technical education. As the project staff worked to keep abreast of the latest developments in career and technical education research and exemplary practices, a concerted effort was made to stay informed and in communication with other projects and activities of the National Research Center for Career and Technical Education and the National Dissemination Center for Career and Technical Education. The Compendium of Design Reviews is available at: http://new designs.orst.edu.

National Design Studios

During 2000 and 2001, the project staff directed four National Design Studio workshops, each involving about 25 leaders in practice, policy makers, and researchers in career and technical education or in education more broadly. The purpose of the National Design Studios was to involve leaders in career and technical education in critiquing and extending the work of the National Design Group and the project staff, to envision and create new desired features of CTE, and to make application to their local contexts in secondary and postsecondary institutions. The National Design Studios also addressed the mission, principles, and vision for career and technical education in the United States as a result of recommendations made at the fifth and sixth meetings of the National Design Group.

The participants for the Design Studios were selected from nominations solicited from the National Design Group, state directors of Vocational Education, the project director for New American High Schools in the U.S. Department of Education, the director of High Schools That Work, state system leaders for community and technical colleges, board members of the National Council on Occupational Education of the American Association of Community Colleges, the director of the Learning Colleges initiative of the League for Innovation in the Community College, and project staff. The participants were selected to represent leadership in innovation in career and technical education at the secondary and postsecondary levels, a range of employment position responsibilities, a variety of geographic areas, local- and state-level responsibilities, and diversity in gender and ethnicity (to the extent this information was available during the nominating process). Those requested to make nominations were asked to give special attention to identifying individuals and places that would make good demonstration sites for project recommendations in the future. This consideration was taken into account in selecting participants for the design studios, including selection of teams of individuals from a few places. The listing of National Design Studio participants is shown at: http://newdesigns.orst.edu.

The Design Studios were 3-day events, with an agenda that engaged the participants in systematic review of emerging recommendations and issues and also involved site visits and presentations focused on exemplary practices in career and technical education. Participants were engaged in the actual design process for career and technical education using the Design

Reviews described above. They also were asked to review and make use of the work that had been done by the participants in preceding National Design Studios. Analysis of the results of the design studios was used to revise, extend, and verify the recommendations emerging from the project. The National Design Studios were also one form of early dissemination of project findings where leaders in the field could learn about and apply findings to their own institutions, agencies, and organizations.

Internet-Supported Learning Community

Another activity of the project was to develop and make use of an Internet-supported learning community within the constraints of available resources via the project's Web site to enhance communication with and among the project staff and the National Design Group, participants in the Design Studios, and the wider audience of career and technical education leaders in practice and policy makers. The Internet-supported learning community was another form of dissemination of project findings that was available to a broader audience to increase awareness and potential for application.

This learning community was designed so that its participants contributed to and took from the knowledge base on New Designs for career and technical education. Because funds were limited, the development and testing of the Internet-supported learning community was largely focused on the National Design Group and, to the extent funds permitted, participants in the National Design Studio workshops.

APPENDIX II.
NATIONAL DESIGN GROUP MEMBERS[2]

Yaw Adutwum, Business and Technology Teacher
Manual Arts High School
Los Angeles, CA

Neils W. Brooks, State Director
Career and Technical Education Services
Virginia Department of Education
Richmond, VA

Sharon Grossbach, President
Hennepin Technical College
Brooklyn Park, MN

Earl Hale, Executive Director
Washington State Board of Community and Technical Colleges
Olympia, WA

Victor M. Hernandez, Associate Professor
Florida State University
Tallahassee, FL

Cheryl Ann Hinerman, Workforce Development Manager
Pacific Northwest and International
Intel Corporation
Hillsboro, OR

Bruce A. Jilk, Architect and Educational Planner
KKE Architects, Inc.
Minneapolis, MN

Velma Moran-Garza, Counselor
Zapata High School
Zapata, TX

Virginia Pease, District Coordinator for Practical Arts and Vocational Programs
Hopkins School District #270
Hopkins, MN

[2]Professional positions and locations were current at the time of the last Design Group meeting, held October 2001.

Jane Plihal, Associate Professor and Chairperson
Department of Work, Community and Family Education
University of Minnesota
St. Paul, MN

Gerald Pumphrey, President
Bellingham Technical College
Bellingham, WA
Previously:
Vice President of Instruction
Guilford Technical Community College
Jamestown, NC

Dianne Sole, Superintendent
Polytech School District
Kent County Schools
Woodside, DE

Ronald Talley, Department Head
Electronic Engineering Technology
Tri-County Technical College
Pendleton, SC

APPENDIX III.
PROCESS FOR DEVELOPING PROFESSIONAL JUDGMENT RATING AND LINKING TO RELATED RESEARCH, POLICIES, AND EXEMPLARY PRACTICES

Based on the work by the National Design Group and National Design Studios, and by the project staff in developing the Design Reviews, the validity and trustworthiness of each design feature recommendation was ascertained in terms of the professional judgment of leaders in practice (from participants in the National Design Group and Studios) and research support (from the review of related literature provided by the Design Reviews). These two forms of assessment are described below.

Professional Judgment Rating

The professional judgment rating of each recommended operational feature of career and technical education is based on the results of asking the National Design Group and National Design Studio participants to continually assess the relative importance of each of the features as it emerged during the project's activities. The importance rating is relative to other desired features included for a particular design element. All the features included for the element are important; otherwise the feature would not be included in the recommendations at all. So, the rating is one of relative importance among features, which have already been judged as important to successful career and technical education. The design features were placed in three categories, based on the mean ratings of importance by the participants in the National Design Studios held in 2002. The categories are those with mean ranks of 1 to 5 (the top 5), those with mean ranks of 6 to 10 (the next 5), and those with mean ranks of 11 or greater (11 or more features are included for a design element). The first listed design feature for all design elements relates to the alignment of design features among all design elements. It has automatically been assigned to the top-5 category, so this category really contains 6 design features. The categories have been converted to symbols for the purposes of presentation in Appendix IV.

Linking to Related Research, Policies, and Exemplary Practices

The relationship between the desired features of career and technical education recommended for each design element and related research, policies, and exemplary practices was developed by cross-referencing the content of each desired feature with the focus of each design review completed for the project (see the separate companion report entitled *Compendium of Design Reviews of Related Research, Policies, and Exemplary Practices* available at: http://newdesigns.orst.edu). Each of the design reviews was numbered for identification purposes. The tables shown in Appendix IV indicate the identification number(s) of the design review(s) that were determined by the project staff to be related to each desired feature recommendation. The referenced design reviews can be consulted for more in-depth information on definitions, detailed features, and implications for action. As noted above, they are available at: http://newdesigns.orst.edu.

APPENDIX IV.
RECOMMENDED OPERATIONAL DESIGN FEATURES FOR CAREER AND TECHNICAL EDUCATION

In this section, the full set of recommended features of CTE is presented for each of the 12 operational design elements described earlier in this report. The recommendations are presented in priority order according to the professional judgment rating developed from input of the National Design Group and National Design Studios participants. Recommendations for each element are introduced by first posing the questions that were addressed by project staff, the National Design Group meetings, and the National Design Studio workshops. Further, each recommended design feature has been classified in terms of:

1. **Presence in terms of progressiveness and extent of current application in career and technical education** (i.e., Cutting Edge – futuristic and should be added, does not exist in most career and technical education programs at present; Bring to Scale – exists in some programs, but needs to be present in many more, need to bring to scale; Keep – exists in most career and technical education programs, continues to be important and should be kept).

2. **Relevance to secondary and postsecondary levels of career and technical education** (i.e., relevant to only Secondary CTE, relevant to only Postsecondary CTE, relevant to both Secondary and Postsecondary CTE).

3. **Uniqueness to career and technical education in contrast to other areas of education** (i.e., Unique to CTE, Not Unique to CTE).

Validation of project recommendations was achieved in two primary ways: (1) peer review by leading practitioners in career and technical education at the secondary and postsecondary levels from across the United States (through the National Design Group members and National Design Studio participants), and (2) support in available research literature (through the Design Reviews that summarize research, policies, and exemplary practices relating to CTE and are available at: http://newdesigns.orst.edu). For each element, the first desired feature presented—consistent with the aims of this project—is that the recommended features for the element be consistent and coherent with recommended features for all other design elements.

The following key, used in the tables presented below, indicates assessment of each recommended design feature on the dimensions described above:

Presence in terms of newness and extent of current application in CTE

CE = Cutting Edge
S = Bring to Scale
K = Keep

Relevance to secondary and postsecondary levels of career and technical education

B = Both Postsecondary and Secondary
PS = Postsecondary Only
S = Secondary Only

Uniqueness to career and technical education in contrast to other areas of education

NU = Not Unique to CTE
U = Unique to CTE

Professional judgment of importance

■ = Ranked 1 to 5 in importance
● = Ranked 6 to 10 in importance
◆ = Ranked 11 or more in importance

Link to related reviews, policies, and exemplary practice

List of related Design Reviews by identification number (Design Reviews are available at: http://newdesigns.orst.edu).

Learning Context for Career and Technical Education

Recommendations relating to the learning context for career and technical education at the secondary and postsecondary levels are presented in two parts. The first part addresses the context for the whole high school or college where career and technical education is only one component. The second part focuses specifically on the context of career and technical education in the high school and community/technical college.

Recommended Design Features of Learning Context of Whole School/College Relating to Career and Technical Education

QUESTION: What are the most important design features of the learning context (i.e., assets, challenges, opportunities, aspirations) of the *whole school/college* that need to be considered by career and technical education at the secondary and postsecondary levels?

Table 1.
Recommended Design Features of Learning Context of Whole School/College Relating to Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Be up-to-date and vibrant – Requires that the learning experience be current and dynamic, encourage innovation, and unleash all human potential in response to an ever-changing context.	S	B	U	■	2, 3, 7, 12, 22, 23, 24, 31, 37
Build shared vision of quality – Requires development of clearer and more focused direction and commitment to high quality that is deeply shared by stakeholders.	S	B	U	■	4, 5, 6, 10, 19, 27, 86
Search for coherent synergy and connectedness – Requires more and newer forms of coherent partnerships, alliances, compacts, and collaborations with families, business and industry, labor, education, and community-based organizations.	S	B	U	■	6, 9, 11, 12, 17, 18, 86
Be portable for the learner – Requires that what is learned be transportable and recognized (credited) in other learning environments.	S	B	U	■	11, 12, 37, 42
Enhance public perception and credibility – Requires creating and maintaining a more positive public image of education.	S	B	U	■	4, 5, 12, 19
Insure usefulness of learning – Requires attention to the application of learning to the challenges and opportunities of all life places (i.e., personal, work, community, family).	S	B	U	●	2, 12, 13, 19, 22, 23, 24, 36, 39, 66, 86
Design with external community – Requires planning the learning experiences by listening to and working with the community external to the school or college.	S	B	U	●	28, 65, 66, 67, 86, 95
Increase and enhance use of learning technology – Requires learning technology that is accessible, maintained, and used extensively.	S	B	U	●	11, 78, 92
Be cost-effective and sustainable – Requires constant attention to developing needed resources, improving cost-effectiveness, and operating with economic sustainability.	S	B	U	●	28, 65, 66
Improve accountability – Requires better accounting for learning done in a variety of ways, and that the institution as a whole be performance-based.	S	B	U	●	78, 92, 94, 96, 97, 98
Respond to all learners – Requires increased focus on, responsiveness to, and success for all learners.	S	B	NU	◆	14, 78
Be a component of lifelong learning – Requires the learning experience to build on prior learning experience and be integrated with and encourage lifelong learning.	S	B	U	◆	13, 64, 86, 103
Be realistic – Requires that recommendations for improving learning be feasible in terms of available resources.	K	B	U	◆	10
Enhance global perspective – Requires an international perspective of learning expectations, processes, and organization.	K	B	NU	◆	20, 21, 78
Give pride and joy – Requires developing more pride and joy (recognition and reward) in the learning experience by staff and learners.	S	B	U	◆	99

Recommended Design Features of Learning Context for Career and Technical Education

QUESTION: What are the most important design features of the learning context (i.e., assets, challenges, opportunities, aspirations) that is specific and unique to career and technical education at the secondary and postsecondary levels?

Table 2.
Recommended Design Features of Learning Context for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with the larger context – Assures that the context for CTE is supportive and contributes to the larger context faced by the whole school or college, of which CTE is a part.	S	B	U	■	
Become a learning system – Insures that secondary and postsecondary career and technical education operate as a coherent and connected system (i.e., trouble-free transfer of learning internally and externally, staff teaming across educational levels, unlimited advancement and continued learning, aligned prerequisites, concurrent and dual enrollment).	S	B	NU	■	1, 37, 42, 63, 67, 68, 69, 86, 87, 88, 89
Build partnerships – Aggressively develops new and renewed alliances with the community to enhance learning opportunities in career and technical education.	S	B	NU	■	8, 9, 17, 18, 65, 66, 69
Attract and sustain teachers – Provides feasible ways of staffing and staff development for teachers to insure very high quality career and technical learning opportunities.	S	B	NU	■	70, 71, 72, 74
Define high quality – Describes a coherent and cohesive set of features for model career and technical education, and needed changes in current programs.	S	B	NU	■	5, 6, 15, 16, 20
Improve image – Very positively enhances perception of career and technical education to students, parents, and school and college staff.	S	B	U	■	20, 49
Provide adequate and flexible resources – Promotes resource sustainability (i.e., better use of existing sources, developing new sources, increasing flexibility of use, being more realistic in plans) for providing and continuously improving learning opportunities in career and technical education.	S	B	NU	●	6, 8
Develop leadership – Identifies the needed skills and develops an effective administrative leadership cadre for present and future career and technical education.	S	B	NU	●	8, 73
Serve all students – Is perfectly clear that career and technical education provides learning opportunities that are valuable and accessible to all students.	K	B	NU	●	12, 16, 19, 24, 76
Expand thinking – Openly considers new and innovative approaches to career and technical education and the effective breakdown of resistance to make needed changes.	S	B	NU	●	12
Include multiple purposes with appropriate assessment – Seriously affirms that career and technical programs address many purposes (e.g., work, family, community; short- and long-term goals; various educational levels) that are all valued and require varied foci and means of assessing learning.	S	B	NU	●	1, 2, 3, 6, 8

Learning Audience for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning audience to be served by career and technical education at the secondary and postsecondary levels?

Table 3.
Recommended Design Features of Learning Audience for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning audience are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Identify the various groups who are to benefit – Identifies who is to benefit from career and technical education in name and characteristics. Include the following categories of learners:					
Individuals – Youth and adults.	K	B	NU	■	1, 17, 19, 23, 24 25, 26, 49, 86, 90
Organizations – Business and industry, organized labor, other educational institutions (i.e., K–12, college, university), government agencies, and professional associations.	S	B	U	■	2, 11, 17, 28, 86, 90
Geographic regions – Communities, regions within states, states, multi-state regions, nation, and world.	K	B	NU	■	1, 6, 11, 12, 16 19, 20
Society-at-large – Whole social and economic culture.	K	B	NU	■	1, 2, 3, 12, 15, 18, 24, 25, 27, 86, 90
Describe the needs of the groups who are to benefit – Identifies the needs, both educational and supporting services, by the groups who are to benefit from career and technical education.					1, 8, 15, 49
Needs of Individuals –					
Initial specialization – Those needing preparation for first real roles and responsibilities in work, family, and community life; could be focused on career cluster or specific occupation; includes all aspects of the industry; could be youth or older individuals entering work, family, and community roles for first time.	CE	B	U	■	2, 3, 7, 11, 16 18, 23, 49
Exploration – Those needing more in-depth study and first-hand experience with their own interests, aptitudes, and capabilities and the world of work, family, and community; includes career and technical planning and decision-making skills; could be individuals of young age contemplating future career and technical opportunities or older individuals considering role mobility, both voluntary and involuntary.	CE	B	U	●	1, 5, 6, 7, 12, 17, 23, 25, 90
Retraining – Those needing to prepare for different roles and responsibilities in work, family, and community life because of a wish to change roles and responsibilities or a need to change because of changing context (e.g., loss of job).	CE	PS	U	●	1, 8, 18, 23, 28

Updating/advancement – Those needing continuing education or changes in work, family, and community roles and responsibilities they currently have in order to keep/perform better in the role or seek the opportunity of promotion in salary, position, or other benefits.	CE	PS	U	●	1, 2, 8, 20, 23, 28, 64, 103
Academic – Those needing general academic skills not specific to career and technical education; could range from basic literacy or remediation in reading, communications, and mathematics to advanced theoretical knowledge in science, social studies, arts, language, and mathematics; could be individuals of any age.	K	B	NU	●	1, 4, 5, 6, 7, 23, 24, 25, 26
Awareness/orientation – Those needing an introduction to the world of work, family, and community roles and responsibilities and opportunities; could be individuals of elementary age or immigrants or others entering work, family, and community roles and responsibilities for the first time.	CE	B	NU	●	1, 2, 5, 7, 8, 23, 24, 25, 76
Support services – Those services needed in support and encouragement to be successful in career and technical education (e.g., child care, transportation, financial aid, health, counseling).	K	B	NU	◆	16, 18, 25
Further education and living – Those needs for both continued learning and the opportunities it provides, as well as preparing for direct and successful entry into the world of work, family, and community life.	CE	P	NU	◆	3, 17, 19, 25, 28, 63, 64, 103
Needs of Organizations, Geographic Regions, and Society-at-Large—					
Willingness to partner – Need for working together to gain mutual benefits not available effectively or efficiently when working separately.	K	B	NU	◆	5, 6, 17, 28
Access to competence – Need for continuously well prepared workers, family members, and community contributors leading to economic and social development and improved quality of life.	K	B	NU	◆	8, 11, 17, 18, 19, 22, 25, 27, 28, 76
Attend to long- and short-term benefits – Addresses both the short- and long-term needs of the groups who are to benefit from career and technical education.	K	B	NU	◆	8, 11, 16, 18, 22, 25, 28

Learning Signature for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning signature (e.g., story, phrase, picture, song, object, person) that communicates the unique or special nature of career and technical education at the secondary and postsecondary levels?

Table 4.
Recommended Design Features of Learning Signature for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning signature are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Create an accurate image – Is authentic to the aims, operation, and accountability of career and technical education; is real in terms of how career and technical education goes about its operation. *Include as Essential Defining Concepts–* • Balanced attention to knowledge and skills. • Learner-centeredness. • Link to real work, family, and community life. *Include as Important Defining Concepts–* • Building network of relationships and opportunities. • Reaching ever-changing high standards. • Sustaining human potential and quality of life.	CE	B	U	■	5, 15, 29, 30, 32, 33, 85
Develop a common understanding and ownership by stakeholders – Is easily understood by and rallies all groups holding an interest in career and technical education, including learners, staff, and wider community.	S	B	U	■	29, 30, 31
Provide a unique character – Highlights the specialness of career and technical education and distinguishes it from other educational programs.	S	B	U	■	32, 33, 34
Confirm a worthy identity – Affirms a morally and intellectually justifiable focus for career and technical education.	K	B	NU	■	31, 33
Integrate consistently into the operation of the institution – Is woven into and radiates from all elements of career and technical education operation.	S	B	NU	■	30, 32
Give focus and coherence to all components – Unites all elements of career and technical education in a common purpose.	S	B	NU	●	30, 33
Include all learners – Affirms, embraces, and affects the spirit of all learning audiences served by career and technical education (e.g., young and old, female and male, poor and rich, all ethnic groups).	K	B	NU	●	29, 33, 63, 64, 76
Communicate powerfully an unbroken chain of commitment (the promise) – Is a forceful and energetic symbol of career and technical education.	S	B	NU	●	32, 33, 34

Learning Expectations for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning expectations (i.e., results, outcomes, standards) for career and technical education at the secondary and postsecondary levels?

Table 5.
Recommended Design Features of Learning Expectations for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning expectations are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	

Includes achieving academic, employability, and specific occupational knowledge and skills.
• **Academic knowledge and skills** – Includes knowledge and skills in language, mathematics, science, social studies, and arts.
• **General career and technical knowledge and skills** – Includes knowledge and skills needed in all work, family, and community roles and responsibilities, including:
  • **Life Planning** – Knowing self and choosing responsibly; interrelating work, family, community, and personal life; caring for personal wellness; working safely.
  • **Relationships** – Collaborative intelligence; understanding organizations; understanding diversity; relating interpersonally.
  • **Technology** – Using technology (as aid, content, context).
  • **Managing** – Managing resources; managing time; setting expectations and evaluating progress; making decisions; planning and organizing; recognizing and resolving problems; taking action; being able to engage; being entrepreneurial.
  • **Work Ethics** – Practicing ethical and moral habits in work, family, and community life.
  • **Continued Learning** – Learning to learn (and unlearn); self-sustaining.
• **Specific career and technical knowledge and skills** - Includes knowledge and skills needed for particular work, family, and community roles and responsibilities (i.e., in the context of work roles, these knowledge and skills are those needed in specific occupational clusters and jobs and all aspects of the industries where the jobs are located).
	S	B	U	■	2, 3, 5, 11, 12, 13, 15, 16, 17, 18, 19, 20, 33, 36, 37, 38, 40, 41, 42, 43, 44, 45, 46, 47, 48, 66, 69, 85, 103

Communicate clearly and concisely the results or standards expected and promised – Makes straightforward and coherent statements of what learners are expected to accomplish.	K	B	NU	■	33, 35, 36 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 92, 97, 98

Involve reaching for a meaning of educational excellence that provides challenges and opportunities – Addresses the highest and most rigorous expectations for what it means to be an educated person from a career and technical perspective—even beyond what is easily measured.	S	B	NU	■	8, 13, 20, 36, 37, 40, 41, 42, 43, 44, 45, 46, 47
Direct attention towards changing context and challenges of life upon entering the 21st century – Is future-oriented and leads to action as relates to the problems and opportunities in work, family, and community life.	S	B	NU	■	2, 3, 5, 6, 7, 12, 13, 21, 22, 31, 33, 36, 37, 38, 41, 42, 76, 85, 90
Survive challenges from key internal and external stakeholders in career and technical education – Seeks examination and support by stakeholders in career and technical education (i.e., students, staff, business and industry, organized labor, other educational institutions, community, professional associations, accreditation agencies).	S	B	NU	■	11, 15, 30, 35, 36, 41, 42, 97, 98
Prepare learners to be active change-agents in improving the future state of affairs in society – Prepares learners to be engaged in improving the quality of life in our culture—particularly as relates to work, family, and community roles and responsibilities.	S	B	NU	●	11, 33, 38, 39, 76, 77, 79, 85, 90
Contribute to lifelong learning – Enhances competence to continue to learn, integrates new learning with past learning, and encourages further learning.	S	B	NU	●	16, 33, 36, 38, 64, 103
Represent balanced attention to all areas of human talent and development – Addresses all areas of competence and skill (i.e., occupational, academic, aesthetic, social).	K	B	NU	●	6, 12, 33, 38, 39, 41, 85, 86, 103
Address key life places (i.e., personal, work, family, community) – Addresses the roles and responsibilities of personal, work, family, and community life.	K	B	NU	●	23, 13, 19, 33, 35, 36, 38, 41, 85, 86

Learning Process for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning process (i.e., curriculum, content, instructional methods, assessment strategies) for career and technical education at the secondary and postsecondary levels?

Table 6.
Recommended Design Features of Learning Process for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning process are consistent with and supportive of the desired features recommended for other design elements.	S	B	NU	■	
Build a progressive path to achieving external standards – Has clear desired end results and fosters continuous progress toward these results, leads to meeting demanding academic, general and specific, career and technical learning expectations that are recognized by further education institutions and business and industry, and includes independent assessment of learning expectations.	S	B	U	■	15, 16, 18, 55
Engage learners in relevant and challenging experiences - Instills excitement, is self-motivating, brings out best talents and performance, inspires commitment, opens opportunities, appears doable, provides needed support, is enjoyable, is demanding, connects to learner's vision of future, and engages the learner in knowledge building.	S	B	U	■	6, 7, 11, 30, 31 32, 33, 50, 51, 52, 54, 55, 89
Be learner-centered – Personalizes to the needs and prior learning experiences of each and every learner, closely connects teaching and counseling/student support services in advance learning and career development, allows learners to select from multiple learning strategies to reach learning expectations, provides just-in-time and just-for-you learning experiences, includes multiple entry and exit points, is managed by the learners with guidance by staff, and leads learners to connect learning from different sources and construct a coherent view of their world.	K	B	NU	■	12, 23, 24, 50, 51, 52, 53, 55, 56, 57, 58, 60, 64, 76, 85, 86, 89, 92, 103
Use real-life applications – Connects directly with business and industry and other life contexts; includes internships in employment context; reflects community needs and interests; and involves external audiences in planning and execution.	S	B	NU	■	8, 11, 17, 28, 53, 55, 57, 66, 85, 86
Integrate academic learning with career and technical learning – Integrates and relates academic with career and technical education as it is needed in the context of work, family, and community roles and responsibilities.	S	B	NU	■	14, 19, 36, 37, 69, 85, 90
Use and closely coordinate non-school and school learning settings – Makes ample use of multiple learning settings in and out of the school (i.e., workplace, home, community) and careful planning and supervision of learning in non-school and school settings.	S	B	NU	●	49, 55, 57, 66, 67, 69, 85
Use project-based learning – Uses real projects drawn from needs external to the educational institution; results in products valued outside of the school or college; and encourages learning projects to be initiated and managed by the learners.	S	B	NU	●	56, 85, 89

Involve teachers as guides and facilitators – Recognizes and values contribution of learners and importance of involving learners in managing the learning; is directed by staff (as navigators) who are up-to-date with subject matter, its application, and use of information technology in learning.	S	B	NU	●	49, 50, 52, 53 54, 55, 56, 58, 85, 86, 89
Apply continuous and multiple forms of assessment to improve learning – Uses frequent, immediate, and a variety of assessment and feedback strategies to improve the learning experience.	S	B	NU	●	55, 92, 93, 94
Create and nurture learning communities – Creates and nurtures a sense of community by fostering close interaction of learners with other learners, teachers with learners, and teachers with other teachers; involves abundant cooperative learning; uses peer teaching; and blends learners of different ages and experiences.	S	B	NU	●	50, 51, 53, 60, 62, 76, 85, 86, 89

Learning Organization for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the organization of learning for career and technical education at the secondary and postsecondary levels?

Table 7.
Recommended Design Features of Learning Organization for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of the learning organization are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Organize students so there can be:					
Learning that is learner-centered for each student and based upon external standards (i.e., business and industry, further education) and accountability for individual success.	S	B	NU	■	13, 63, 89
Learning in teams and cohorts within and across subject, using project-based learning and learning communities.	S	B	NU	■	50, 51, 52, 53, 55, 56, 57, 60, 62, 74, 85
Learning that is integrated across educational levels and interdisciplinary subject areas.	S	B	NU	■	11, 58, 60, 68, 69, 85
Learning that is grouped around career clusters or major of learner's choice.	S	B	U	■	
Learning that is more project-based in real-world context.	S	B	NU	■	56, 62, 85
Building by learners of their own networks of experts, consultants, and supporters.	CE	B	U	●	60, 62, 68, 74, 85, 89
Equal access to learning by all learners.	S	B	NU	●	11, 54, 62
Lifelong learning and productive participation in work, family, and community life.	S	B	NU	●	23, 62, 64, 85
Self-grouping of learners around areas of interest and learning events/activities within career clusters.	S	B	NU	●	58, 60, 62, 74, 89

Promise that each and every learner is known by at least one staff member and provided with advocacy by a practitioner in their career field, as needed.	S	B	NU	●	58, 59, 60, 61, 62
Pursuit of topics of interest to learners in more depth, skill, and refinement.	S	B	NU	◆	17, 60, 64
Building of self-esteem, pride, and a joy for learning and the world of work, family, and community life.	S	B	NU	◆	60, 64
Linking together students across distance using technology.	S	B	NU	◆	78
Peer teaching/mentoring of other students.	S	B	NU	◆	50, 51, 56, 60, 74, 89
Organize time to:					
Result in achievement of necessary levels of competence and attainment of work, family, and community standards and benchmarks.	S	B	NU	◆	8, 13, 16, 17
Take advantage of solid academic, career and technical, and continuing education study and work, family, and community experience.	S	B	U	◆	8, 69
Give value and credit for (and not repeat) prior learning experience.	S	B	NU	◆	61, 63, 67, 69
Be sufficiently flexible to meet unique needs of students and topics to be learned.	CE	B	NU	◆	10, 13, 60, 61 62, 63, 85, 89
Be self-paced and self-managed with specific goals and checkpoints.	CE	B	NU	◆	60, 61, 62, 63, 89
Integrate and coordinate learning across educational levels and work settings.	S	B	NU	◆	11, 17, 62, 68, 69, 85
Be widely accessible in terms of time, place, and delivery.	CE	B	NU	◆	10, 63
Be planned in a just-in-time manner based on local, regional, and national needs and to eliminate time as a barrier to competency-based learning.	S	B	U	◆	14, 61
Occur individually and in small groups and teams.	S	B	NU	◆	58, 62, 89
Organize learning settings to:					
Allow learners access to mentors, coaches, experts, and authentic context; learning settings are flexible and centered around the learning experience.	CE	B	NU	■	62, 85
Allow learners access to a variety of settings (i.e., formal, informal, self, small groups, large groups, on-line, studios, in school/college, in business, in community).	CE	B	NU	■	17, 62, 85
Create multiple strategies for learning and choices (i.e., classes, books, experience—cooperative education, internships, shadowing, self-study, on-line).	S	B	NU	■	60, 61, 62, 85
Form small learning communities.	K	B	NU	■	62, 68, 74, 85
Have learning that is kept up-to-date (i.e., has built-in revision cycle).	K	B	NU	■	65
Have needed technology readily accessible through collaborative agreements with governmental, non-profit, and for-profit agencies.	K	B	NU	●	65
Coordinate and combine school-, work-, and community-based learning; expand collaborative learning.	S	B	NU	●	2, 14, 16, 17, 50, 85
Have learning settings designed by learners and being able to add and subtract to/from the setting, as needed.	CE	B	NU	●	14, 85, 86
Network learning settings with input from learners to form patterns that support learning.	CE	B	NU	●	60, 85
Organize subjects or fields of study to:					
Have learning lead to competence needed in work, family, and community roles and responsibilities.	S	B	U	■	12, 16, 18

Integrate the various subjects.	S	B	NU	■	11, 16, 60
Make learning standards-based and attend to how results will be assessed.	S	B	NU	■	16, 17, 58
Allow experiential application in work, family, and community environments.	S	B	U	■	53, 62
Make learning project-based.	S	B	NU	■	56
Prepare for the changing nature of work, family, and community life, and provide for cross-training within and among career clusters.	CE	B	U	●	58, 62, 89
Allow learning to be driven by student interests and characteristics as related to work, family, and community roles and responsibilities.	CE	B	U	●	2, 89
Insure the same learning result from different methods and ways of delivering learning, and from different teachers and perspectives of learning.	S	B	NU	●	62, 68
Modularize learning to increase access at different times and places and from different delivery modes.	CE	B	NU	●	61
Allow learning to progress from basics (if prior learning is not awarded) to in-depth knowledge and experience.	S	B	NU	●	64
Have learning be sensitive to and affirm cultural diversity (domestic and international) in all subjects.	S	B	NU	◆	20, 76, 89
Organize staff to:					
Co-facilitate learning with students and others, and model collaboration.	S	B	NU	■	17, 60, 62, 72
Integrate learning across subjects, professional roles, and learning settings.	CE	B	NU	■	16, 62
Have staff be broadly inclusive of a variety of groups (e.g., licensed teachers, employers, parents, community leaders, labor union representatives).	CE		U	■	14
Have staff engaged in joint planning and delivery of learning experiences.	S	B	NU	■	12, 75
Have staff engaged in and be recognized for their own continuous professional development.	S	B	NU	■	16
Have staff effectively manage the learning experience.	S	B	NU	●	
Have staff be flexible in terms of subjects and levels that can be addressed through blending of roles and cross-training.	S	B	NU	●	14
Organize decision making to:					
Coordinate learning among all education levels (i.e., K–12, community college, university).	S	B	NU	■	67, 69
Involve learners in the decision-making process.	CE	B	NU	■	12, 50, 56, 60, 62
Make decisions based on research and data.	S	B	NU	■	
Have broad participation (i.e., students, faculty, counselors, administrators, community, policy makers, funding sources, employers) in decision-making processes that are inclusive and multidimensional—both vertically and horizontally.	S	B	NU	■	77
Make the learning meaningful.	S	B	NU	■	50, 56, 62
Have shared ownership in decisions and with common agreement.	S	B	NU	●	60, 62, 77
Have external organizations and groups (e.g., employers) decide if the students meet the needs of their profession.	CE	B	U	●	42, 43, 44, 45, 46, 47
Decentralize decision making to all stakeholders (i.e., those most affected, knowledgeable, and responsible).	S	B	NU	●	17, 18, 62, 77
Have policy makers and funding sources share in decision making to improve learning experiences and provide financial support.	S	B	NU	●	8, 18
Have staff decide if the learning experience is consistent with mission, vision, and beliefs of the organization and profession.	S	B	NU	●	86

Learning Partnerships for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning partnerships for career and technical education at the secondary and postsecondary levels?

Table 8.
Recommended Design Features of Learning Partnerships for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Partnership Features—					
Align with features of other design elements – Assures that the design features of learning partnerships are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Focus on enhancing student learning – Focuses primarily on meeting student needs and learning.	S	B	NU	■	4, 11, 20, 65, 66, 67, 68, 69
Collaborative, mutually beneficial relationship – There is reciprocity in short- and long-term gains by all partners, and sharing of common goals and values.	S	B	NU	■	17, 18, 20, 65, 66, 69, 86
Working through partnerships as the regular way of operating – The use of partnerships is always an early consideration in the operation of the educational institution, and everyone is involved in forming partnerships.	S	B	NU	■	10, 11, 17, 20, 65
Agreement to continuous evaluation, re-thinking, and innovation – There is willingness and energy for improving the partnership over time and, with a changing context, willingness to draw the partnership to an end when appropriate.	S	B	NU	■	10, 20, 65
Joint commitment and engagement – There is tangible agreement to be fully engaged in working and investing together on continuous bases.	S	B	NU	■	8, 11, 18, 20, 65, 67, 69, 86
Clear roles and contributions – Specific roles and responsibilities are clearly established and supported by all partners.	S	B	NU	●	4, 16, 18, 65, 69, 86
All needed partners are represented and deliver on promises – All partners are active in the partnership and have ability to deliver on their commitments.	S	B	NU	●	12, 16, 17, 18, 65
Time and funding is committed for planning and communications among partners – The resources to sustain the partnership are provided by all those involved.	S	B	U	●	16, 17, 18, 65, 67
Timely sharing of information – Information sharing is planned, monitored, and flows easily and openly in a timely manner among partners.	S	B	NU	●	12, 18, 65, 67

Learning Staff for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of the learning staff competencies, staffing strategies, staff development providers, staff development, and leadership for career and technical education at the secondary and postsecondary levels?

Table 9.
Recommended Design Features of Learning Staff for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Staff Competencies—					
Align with features of other design elements – Assures that the design features of learning staff are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Knowledge of subject matter (learning expectations) – Includes knowledge and skills such as theory and application to work, family, and community roles and responsibilities; certification by external organizations such as industry and professional associations; varied and in-depth experience in work, family, and community roles; all aspects of the industry; general career and technical skills and knowledge such as workplace readiness/employability skills; needs for work, family, and community roles and responsibilities; academic foundations and basic skills; and interrelationships of work/family/community life.	S	B	NU	■	16, 17, 20, 70, 72, 73, 75
Know about making learning authentic and contextualized – Is able to relate learning to real situations outside of school/college in terms of planning and assessing learning experiences.	S	B	U	■	12, 16, 70, 72, 73
Able to guide learning (i.e., faculty, counselor, designer) – Includes skills such as focusing on learning expectations, responding to diverse learners, designing instruction (both formal and informal), pre-planning and just-in-time instructional responses, assessing learning, using information technology, integrating curriculum, guiding cooperative and project-based learning, and coordinating school- and work-based learning.	S	B	NU	■	12, 16, 17, 50, 51, 53, 55, 56, 66, 70, 72
Work in teams and as partner – Includes skills such as collaboration, teamwork, interpersonal skills, and fostering partnerships to bring in specialized expertise.	S	B	NU	■	12, 20, 70, 72, 73, 74, 86, 89
Be creative and entrepreneurial – Includes skills such as risk-taking, being courageous and visionary, willingness to try new ideas, and troubleshooting to improve learning.	S	B	NU	■	70, 72, 73, 86
Will continue to learn – Includes skills such as commitment to being up-to-date, continually improving practices, being lifelong learner, being flexible and proactive, recognizing the importance of staffing effectiveness of CTE; valuing and contributing to regular assessment of their practice; seeing lifelong learning as a shared responsibility of individuals and institutions.	S	B	NU	●	12, 16, 64, 70, 72, 89

Lead in and use continuous quality improvement – Staff applies continuous quality improvement (i.e., plan, act, collect data, reflect) to the learning experience and program with expectations of excellence that are constantly updated, performance that is continually assessed, and rewards and recognition that are closely linked to meeting expectations.	S	B	NU	●	70, 72, 73
Willing and able to take leadership – Staff takes on leadership roles when needed from a variety of positions.	S	B	NU	●	11, 70, 73, 86
Able to train others to do training – Staff knows how to train-the-trainer.	S	B	NU	●	70
Ensure that each learner is known and served very well – Staff takes time to get to know each learner deeply (including prior learning) and provides the "wrap-around" and advocacy support (i.e., academic, social, psychological, physical) needed by each learner in an integrated fashion.	S	B	NU	●	19, 70, 86, 92
Handle multiple roles – Staff knows their roles and responsibilities, and are competent and willing to make a contribution to the learning experience in a variety of ways (e.g., teacher, counselor, mentor, leader, follower, supporter, resource manager).	S	B	NU	◆	70, 72, 73, 86
Build learning communities – Staff facilitates the development of strong learning communities, including those inclusive of secondary and postsecondary staff, using skills such as organizing and leading teams, understanding and valuing diversity, establishing trust, balancing freedom and responsibility, being supportive, and building and maintaining a positive attitude.	S	B	NU	◆	12, 68, 70, 73, 76, 86, 87, 89
Value diversity – Staff understands, values, and incorporates diversity into the fabric of learning, and can operate effectively with a diversity of learners and partners.	S	B	NU	◆	70, 76, 86, 89
Have pride in work and instill pride in learners – Staff are proud of their work, and are able to instill pride in students for their own work.	S	B	NU	◆	70, 73
Staffing Strategies—					
Align with features of other design elements – Assures that the design features of staffing strategies for learning staff are consistent with and supportive of the design features recommended for other design elements.				■	12, 20, 67, 68, 69, 72
Form partnerships with sources of teaching skills – Includes business and industry, labor, professional associations, technical and community colleges, between secondary and postsecondary institutions, universities, and accreditation agencies as potential partners.	S	B	U	■	
Develop compensation plans for faculty in concert with collective bargaining units in order to compete for their skills in the labor market – Includes consideration of separate pay scale for CTE teachers, bonuses, stipends, and contracting with industry for joint appointments.	CE	B	U	■	70, 72
Use faculty skills from other than CTE faculty – Uses the teaching skills of other staff through cross-training (i.e., academic faculty, counselors).	S	B	NU	■	89
Develop additional ways to obtain needed teacher training – Includes making teacher training more self-directed and using distance delivery.	S	B	NU	■	
Develop additional funding sources for faculty and faculty training – Includes increased tuition for CTE courses, fees for services provided through CTE facilities and staff, and partnerships with sources of teaching skills.	S	B	U	■	72

Make use of current students – Includes using more skilled and experienced CTE students (youth and adult) to do peer training and provide assistance to teachers.	S	B	U	●	
Identify what competencies each group of staff needs – Identifies the specific roles for each source of staffing identified above.	S	B	NU	●	
Attract former students – Includes recruiting former students and assisting in their faculty training (i.e., "grow your own").	CE	B	U	●	
Provide succession plans for staffing – Systematically plans for filling positions of staff that will be leaving.	CE	B	NU	●	
Conduct own faculty training – Hires specialized staff-development providers alone or in consortium agreements with others.	S	B	NU	●	71
Recruit qualified retirees from other occupations – Includes the military as well as civilian occupations; offer part-time, flex-time, and shared-time opportunities; certification issues will need to be addressed and brought up-to-date with current realities.	S	B	NU	◆	103
Challenge and encourage role for senior staff – Recognizes and encourages more experienced staff to take responsibility to assist with and guide staffing and staff development strategies.	S	B	NU	◆	12
Staff Development Providers—					
Professional associations.	K	B	NU	■	
Business and industry.	S	B	U	■	71
Consortia arrangements among institutions.	CE	B	NU	■	11
Internet.	S	B	NU	■	
In-house training programs.	S	B	NU	■	71
Consultants.	S	B	NU	●	
Colleges and universities.	K	B	NU	●	
Learners (alone, in self-organized groups, and study circles).	S	B	NU	●	
Peers and colleagues.	S	B	NU	●	71
Community agencies and organizations.	S	B	NU	●	
Vendor.	K	B	NU	◆	
Academic/liberal arts faculty.	K	B	NU	◆	
Staff Development Features—					
Align with features of other design elements – Assures that the design features of staff development for learning staff are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Relevant and valuable – Provides high-quality information, access to key people, is current and cutting edge, uses flexible delivery methods, is just-in-time as needed; provided by very competent staff—dynamic, provocative, challenging, and flexible.	S	B	NU	■	71
Direct connections to business and industry – Provides connections to business and industry through location of training, support, and credentialing; addresses all aspects of industry and learning through, about, and for work.	S	B	U	■	12
Give high priority – Is important to the educational institution, provides sustained support, incentives, and sufficient resources; provides short- and long-range plans; and is viewed as investment rather than short-term expense.	S	B	NU	■	20

Integrate with vision and operation of educational institution – Is closely coordinated, coherent, and imbedded in the mission, vision, needs, principles, priorities, plans, and constraints of the educational organization; is accessible when and where needed; and is supported and modeled in the organization's leadership.	S	B	NU	■	86
Model use of continuous quality improvement strategies – Has built-in processes and tools for assessment and adjustment, and uses flexible delivery options.	S	B	NU	■	12, 71, 86
Make use of distance delivery and computer-enhanced learning – Includes learning for staff through use of remote sites, supported by information technology.	S	B	NU	●	
Owned by staff – Is based on self-identified needs, self-directed, gives considerations to all staff, grounded in local capacity, responsive to individual development plans, and linked with accountability that is addressed by all who are involved.	S	B	NU	●	12, 71
Model of CTE reform initiatives – Demonstrates initiatives such as state-of-the-art teaching and learning, curriculum integration, contextual learning, and partnerships between industry and educational institutions; and sustained over time.	CE	B	U	●	12, 72
Address all aspects of the industry and learning through, about, and for work – Focuses on all dimensions of career and technical education for work roles and responsibilities.	S	B	U	●	2, 72
Include all staff – Responds in a coordinated and consistent way to the educational needs of all those making a contribution to the learning experience and educational organization, and builds educational capacity and the idea of a learning community throughout the organization.	K	B	NU	●	12, 74, 87
Address both subject matter and learning – Includes attention to content and teaching and learning processes.	K	B	NU	◆	75
Improve performance of staff – Applies rigorous standards that are authentic for the organization, visibly connects new learning to the culture and everyday practice of the organization, and expects results in improved learning and retention for students.	S	B	NU	◆	19, 72
Include key stakeholders in school/college (e.g., principals, deans, counselors, staff) – Addresses all components of staff, as well as key external partners and interest groups.	CE	B	NU	◆	70, 87
Include pre-service and in-service needs – Gives attention to initial staff development needs, including adjunct and part-time staff, as well as continuing education and training.	S	B	NU	◆	70, 71
Promote sharing and collegiality among staff – Views all categories of staff as assets, builds on the strengths of the staff, and encourages sharing of good practices among the staff (e.g., staff teaching staff, making tacit knowledge more explicit, publishing and presenting effective theories and practices).	S	B	NU	◆	12, 70, 71, 74, 89
Learning Leadership—					
Align with features of other design elements – Assures that the design features of learning leadership are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Knows CTE – Knows the history, traditions, mission, operation, and finance of CTE.	K	B	U	■	1, 73

Entrepreneurial, creative, risk-taking – Is willing to be bold and open to educational change and reform.	CE	B	NU	■	77, 78, 79, 80, 81, 82, 83, 86
Engaged in and supports professional development – Seeks continuing professional development for self and others.	CE	B	NU	■	73, 79
Willing to partner – Is enthusiastic about working with wide range of partners in advancing CTE.	CE	B		■	77, 79
Empowering of others – Has participatory, collaborative, and shared leadership style.	CE	B	NU	■	12, 77, 79, 80, 81, 82, 83
Supports integration of academic and CTE, and articulation of secondary and postsecondary education – Advocates and supports major education reforms relating to CTE such as curricular integration and program articulation.	CE	B	NU	●	73
Committed, has passion for, believes in, and advocates for CTE – Is strong supporter of CTE.	K	B	U	●	73
Has vision and able to communicate it – Possesses vision for field of CTE and is able to communicate it effectively.	CE	B	NU	●	73
Able to lead change – Is competent in leading transformation of CTE.	S	B	NU	●	73, 77, 78, 79
Able to manage accountability – Supports and encourages use of assessment to insure accountability.	S	B	NU	●	80, 81, 82, 83, 86
Able to manage multiple priorities and information overload – Handles the stress and challenge of a complex environment with competing priorities and abundant information.	CE	B	NU	◆	73, 77, 78, 79, 80, 81, 83, 83, 86
Flexible and competent in multiple environments – Works effectively in a wide variety of leadership contexts and settings.	CE	B	NU	◆	73, 76, 77, 78, 79, 80, 81, 82, 83, 86
Has "can-do" attitude with courage and tenacity – Has self-confidence and persistence to make CTE work effectively.	S	B	NU	◆	73, 77, 79, 80, 81, 82, 83, 86
Has high expectations – Demands high performance from others and self in operation of CTE.	K	B	NU	◆	73, 77, 78, 79, 80, 81, 82, 83, 86
Is an instructional leader – Knows the education enterprise and recognizes the central importance of attention to the learning experience.	K	B	NU	◆	12, 73, 78, 86

Learning Environment for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning technology and facilities for career and technical education at the secondary and postsecondary levels?

Table 10.
Recommended Design Features of Learning Environment for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Technology Features for CTE—					
Align with features of other design elements – Assures that the design features of learning technology are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Enhance learning – Solves problems; produces products; adds new functionality; develops new skills; saves time; is appropriate to purpose; is a learning tool; supports (not drives) learning; encourages more advanced learning; provides additional ways to learn; responds to new reform initiatives such as project-based learning, collaborative learning, authoring, inquiry and knowledge construction, higher order thinking, animation, integration of curriculum, and creativity; centers on learners by being adaptive to individual needs; supports self-directed use; bridges to the future; and is capable of customization.	CE	B	NU	■	5, 8, 13, 78
Increase accessibility – Is affordable; available to all those who can benefit from it; is in sufficient quantity; is easy to use (level of difficulty should be in line with purpose); is close at-hand; has no barriers; is distributed; is personalized; is portable; provides user-friendly training and technical support when needed; requires low maintenance and overhead; is easy to troubleshoot and repair; and is easy to update and upgrade.	S	B	NU	■	13, 91, 78
Tie to industry standards and expectations – Is on par, up-to-date, and compatible with what is in use in business and industry, and promotes adapting to and using new advances in technology.	S	B	U	■	
Facilitate communications and relationships – Helps make connections; locates, filters, and interprets information; bridges time and distance; helps find others with similar interests and needs; stimulates teamwork; supports social networks; taps into new resources; promotes collaboration; and includes responsible use of technology from legal and ethical perspectives.	S	B	NU	■	13
Encompass a wide range of tools, equipment, and software – Recognize that learning technology is broadly conceived and includes much more than computers and other information technology.	S	B	U	■	5, 10, 67
Be affordable and sustainable – Leads to sound investments (e.g., right time, right equipment and software, right price) for short- and long-term; includes partnerships to assist with sustainability; and breaks down barriers to joint use such as cultural and organizational turf.	S	B	NU	●	
Facilities Features for CTE—					
Align with features of other design elements – Assures that the design features of learning facilities are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	

Be learner-determined – Fits the learner, is least restrictive, and involves the learner in its design; creates a feeling of being owned by students and staff, of being at home, and having lifelong connection to the learner; gives the learner a sense of identity, sometimes associated with place—but increasingly with the learning signature and with what is learned and how it is done; assumes and supports informal learning; is responsive to the needs of learners who vary in age, socioeconomic status, cultural background, prior learning experiences, full-time vs. part-time status, and learning style; and supports learning by staff as well as students.	CE	B	NU	■	54, 64, 83, 85, 86, 89
Be flexible and adaptable – Facilitates change, adjustment, reconfiguration, and variety depending on needs; is readily able to shrink or expand as needed; gives careful attention to adjacencies needed for learning; provides rich variety of spaces and furnishings.	S	B	NU	■	85
Facilitate and support learning communities – Supports taking learning anywhere and anytime, integrates staff and students, provides for gracious food service and relaxation; fosters close relationships among and between learners and staff; and supports and encourages informal learning and the productive interaction of informal and formal learning.	CE	B	NU	■	85, 86
Blend with work, family, and community places – Connects to, replicates, uses, and provides opportunity to experience work, family, and community places; contributes to being a seamless extension of the learner's life environments; includes consideration of all of the possible settings that can support the desired learning experiences, which includes, but is not limited to, school buildings; makes strong and visible connections among learning settings; supports reciprocity among settings; and made up of carefully constructed, yet dynamic and constantly changing, patterns of settings needed for effective learning experiences.	CE	B	U	■	2, 84, 85, 87, 88, 89, 90
Support major reform initiatives – Provides the variety of spaces and equipment to readily support project-based learning; encourages and facilitates the close linkage of career and technical education and academic education; encourages and facilitates linkage of career and technical education in high schools and colleges; and provides multiple and ready access to learning technology.	CE	B	U	■	84, 85
Be community-centered – Takes into account culture of community, Builds community, is a center of the community, is used by the community, and is welcoming to the community.	S	B	NU	●	83, 85
Be stimulating, uplifting, and dynamic – Encourages creativity and growth, is beautiful and respected, is provocative of imagination, responds to self-planning, and supports life balance.	S	B	NU	●	84, 85, 86, 87, 88
Serve as a learning tool – Provides opportunities for learning by exposure of facility's infrastructure (e.g., plumbing, electrical, heating, communications).	S	B	NU	●	84, 85
Enhance and fit with natural environment - Mirrors and contributes to natural surroundings and places for relaxation and rejuvenation; and contributes to ecological sustainability.	S	B	NU	●	83, 84
Include places for staff development - Provides spaces that specifically support staff development in ways that model the learning experiences that staff is being encouraged to deliver; supports individual and team development.	S	B	NU	●	85
Provide for both general and specialized study - Provides the settings conducive to development of general and specialized CTE competence in order to reach learning outcomes.	S	B	NU	◆	85, 86, 89

Learning Accountability for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning accountability (i.e., measures, indicators, reporting strategies) for career and technical education at the secondary and postsecondary levels?

Table 11.
Recommended Design Features of Learning Accountability for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning accountability are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Insure significant and meaningful consequences when outcomes are met or not met – Has consequences that matter to organizations and individuals involved in and responsible for CTE.	CE	B	U	■	17, 18, 73, 92, 93, 97, 101
Based on shared mission, vision, goals, and values – Derives from commonly shared and agreed upon in advance mission, vision, values, goals, and responsibilities involving local, state, and federal perspectives and reflects continuous quality improvement in changing environments; has buy-in from students, staff, and other stakeholders; and leads to leveraging of energy, support, and resources.	S	B	NU	■	5, 12, 18, 73, 86, 93, 97, 98
Reflect attention to areas of advocated reform in career and technical education – Includes integration (alignment) of academic and CTE, articulation of secondary and postsecondary levels, coordinating work- and school-based learning, career pathways, improved achievement, obtaining certificates, degrees, and credentials; work placement, work advancement.	S	B	U	■	1, 15, 42, 43, 44, 45, 46, 47, 48, 73, 93, 94, 95, 96, 101
Adapt accountability to changing environments – Provides for changing accountability requirements with changes in social, economic, and political context; takes long-term perspective; and sometimes is willing to go slowly to reach long-term goals with accountability.	CE	B	NU	■	17, 18, 73, 93
Align with funding levels, shares, allocation strategies, and incentives – Links the flow of resources to accountability in ways that connect and contrast costs and benefits and reinforces improving CTE; closely monitors progress toward expectations; and coordinates accountability requirements among institutional processes and funding sources; aligns structural architecture with accountability provisions.	CE	B	U	■	1, 17, 18, 73, 78, 93, 97, 98, 101
Address student, community, state, and national needs – Responds to combined needs of students, community, the state, and national interests through providing and supporting multiple degrees of participation and ways to benefit from CTE.	S	B	NU	●	12, 73, 92, 93, 95, 96, 101
Include principles of continuous quality improvement – Uses the processes and techniques of continuous quality improvement/total quality management.	S	B	NU	●	73, 86, 93, 95, 97, 98, 101
Have a clear purpose – Includes purpose of program improvement and financial auditing, but they are explicit beforehand and based upon the end result; provides overall plan for accountability where component parts fit into a whole plan.	S	B	NU	●	15, 17, 18, 86, 92, 93, 94, 101

Develop realistic outcomes and indicators jointly - Follows from coordinated effort by local, state, federal educational agencies, and other partners to be clear and realistic in terms of measures, processes, and timelines; leads to alliances; and is not self-serving.	S	B	NU	●	15, 18, 92, 93, 94, 95, 97, 98, 101
Recognize and provide for the costs of accountability – Involves consideration of the costs of collecting, analyzing, and reporting accountability information at all levels, and shares total resources reasonably used for these purposes; insures that information collected is necessary and used; builds on existing reporting systems; and provides for training of staff on necessary processes and measures.	S	B	NU	●	18, 73, 78
Provide for and support multiple degrees of participation and ways to benefit from career and technical education – Includes wide variations in length and focus of study, exploration as well as specialization, short- as well as long-term effects, and individuals as well as organizational and community impacts at both secondary and postsecondary levels.	S	B	U	◆	1, 73, 93, 94, 95, 96, 101
Acknowledge limitations in assessment processes and measures – Results from clear understanding of the shortcomings of evaluation strategies and indicators, and efforts that insure assessment information is not misused; and uses both quantitative and qualitative measures and information.	S	B	NU	◆	93, 94, 97, 98, 101
Respect distinctiveness of each institution – Responds to the unique characteristics and external situation faced by each educational institution.	S	B	NU	◆	18, 93, 94, 97, 98, 101

Learning Celebration for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning celebrations (i.e., traditions, rituals, recognitions) for career and technical education at the secondary and postsecondary levels?

Table 12.

Recommended Design Features of Learning Celebration for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning celebrations are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Express and build commitment to and ownership of mission, vision, values, and signature of CTE – Links in meaningful ways to mission, vision, values, and signature of the learning experience; builds sense of community; strengthens ownership in the program by students, staff, and other stakeholders through recognition of value added and high standards; and identifies and deals with barriers.	CE	B	NU	■	99
Have genuine value in commemorating meaningful accomplishments – Are significant to those being recognized, and enjoyable to all those participating; are meaningful and sincere events that contribute to the learning experience.	S	B	NU	■	99
Emanates from, as well as creates, learning cultures – Recognizes continuous growth and renewal in various ways in the educational enterprise—from old and new learning cultures and from within and outside of educational institutions; rooted in CTE culture, as well as helping to advance culture, and thereby connecting past, present, and future.	CE	B	NU	■	76, 99
Conduct at multiple times and ways during a program – Happens at the beginning, at milestones along the way, at end of CTE, and in a wide variety of ways—from simple applause and display to major public events; pays attention to timing and need for continuous encouragement; uses impromptu events and seeks missed opportunities for recognition; makes efforts to include locating some celebrations in the wider community; and uses media to expand and strengthen celebrations.	S	B	NU	■	99
Include all contributors to the learning experience – Includes regular systems of recognizing learners, staff, partners, and community as individuals and groups; and makes special effort to invite others, both internal and external, to the organization.	S	B	NU	■	99
Recognize external standards and benchmarks – Based on expectations drawn from outside the educational institution.	S	B	NU	●	99
Include constant display of learning projects and products – Gives attention to the involvement in projects and their tangible results, such as achieving outcomes and mastery of competencies.	S	B	NU	●	85, 99
Provide continuous motivation and incentives for all learners and staff – Encourages and supports improved learning and performance.	S	B	NU	●	99
Have enough variety so everyone is included at some time - Provides positive encouragement and reaches to all learners, and are conducted in multiple ways and times.	S	B	NU	●	99

Learning Finance for Career and Technical Education

QUESTION: In view of the design features already recommended, what should be the design features of learning finance (i.e., cost reduction, revenue enhancement) for career and technical education at the secondary and postsecondary levels?

Table 13.

Recommended Design Features of Learning Finance for Career and Technical Education

Recommended Design Features	Presence	Level	Uniqueness	Importance	Related Reviews
Align with features of other design elements – Assures that the design features of learning finance are consistent with and supportive of the design features recommended for other design elements.	S	B	NU	■	
Link funding directly and closely to accountability and consequences – Shows return on investment; aligns programs with actual work, family, and community needs in ways that are sustainable; uses continuous program review, and prunes less productive programs; uses cost/benefit and unique need information in making program decisions; establishes clear expectations; and links risk, responsibility, performance, and rewards everywhere.	CE	B	NU	■	1, 18, 73, 100
Be innovative – Encourages thinking "outside of the box" as relates to finances (e.g., relations between labor and management, full-time and part-time staffing); encourages entrepreneurship; supports re-engineering; and encourages flexibility, process documentation, and courage to experiment with and redesign institutional processes.	CE	B	NU	■	73
Focus on priorities – Constantly pays attention to educational priorities, makes distinctions between high and low importance and what should stay and what should change or go, identifies necessities, and reserves resources "off the top" for new high-priority initiatives before budgeting other matters.	S	B	NU	■	18, 73, 100, 101, 103
Use sound fiscal policies and management and report to all stakeholders – Identifies areas of efficiency and inefficiency; constantly examines how "you are doing business"; analyzes cost to the customer in terms of value and market, and prices accordingly; and employs information technology to improve financial practices.	S	B	NU	■	18, 73, 100, 101
Utilize systems thinking when seeking resources from partnerships – Creates a systems-thinking approach to seek and integrate innovative resources from diverse sources; and builds solid cooperative relations with partners (i.e., other educational institutions, business and industry, social service agencies, government) where there are mutual gains and costs that can be shared or shifted; and constantly is on the lookout for new partners.	S	B	NU	■	73, 86, 87, 100
Do long-term thinking and financial planning – Examines long-term costs and benefits with learner and community needs in mind, thinks in terms of investment strategies regarding both costs and benefits, and projects budgets and contingency plans 3 to 5 years into the future.	S	B	NU	●	10

Focus on role of CTE in the system of workforce and economic development – Builds and uses a systems approach in considering how CTE can complement other components of the workforce and economic development "system" (i.e., considers relationship of welfare to work, industry retraining programs, Tech Prep, School-to-Work), and identifies specific roles, contributions, benefits, and funding streams.	S	B	U	●	1, 18, 67, 69, 73, 101
Aggressively seek resources from diverse sources – Develops funds through effective marketing, student retention, grants and contracts, foundations, sales of products and services, leasing vs. buying, joint ownership, partnerships, and importing vs. owning programs.	S	B	NU	●	100
Promote efficiency in learning – Allocates resources based on value added, eliminates waste in funding use, and constantly looks for cost savings involving input from students, staff, and other stakeholders.	S	B	NU	●	1, 18, 73, 100, 101
Encourage schools/colleges to specialize – Fosters program and service specialization among schools/colleges (e.g., centers of excellence, regional centers) to take advantage of economies of scale in terms of enrollments and operating costs such as facilities and equipment.	K	B	NU	●	
Integrate local, state, national, and international planning and resources – Brings together multiple sources of funds, and enhances flexibility in use of resources.	S	B	NU	◆	1, 73, 100, 101
Do purchasing in consortiums with other schools, colleges, and other entities – Develops educational institution-wide budgets (rather than only program-specific) and supports purchasing in cooperation with others.	S	B	NU	◆	103
Develop a foundation fund-development strategy – Develops a foundation for gifts and donations as an additional source of funding.	S	B	NU	◆	
Encourage schools/colleges to seek and promote internal and external cooperation – Insists that programs and services within and among schools and colleges share facilities, equipment, supplies, and staffing.	S	B	NU	◆	103
Provide financial information to stakeholders – Insures that all stakeholders understand funding needs and uses, analyzes services from the perspectives of various stakeholders, builds political base and commitment to funding needs, publicizes/promotes/celebrates successful finance and accountability.	S	B	NU	◆	1, 100, 101
Sell services external to the school/college – Involves the students and staff in producing products, resources, and services that can be sold for a profit outside the educational institution.	S	B	NU	◆	102, 103
Outsource/privatize services where appropriate and where resources can be saved for higher priority uses – Uses outsourcing possibilities, as opposed to providing services from existing budgets, when long-term costs and benefits suggest this as an appropriate strategy.	S	B	NU	◆	102, 103

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